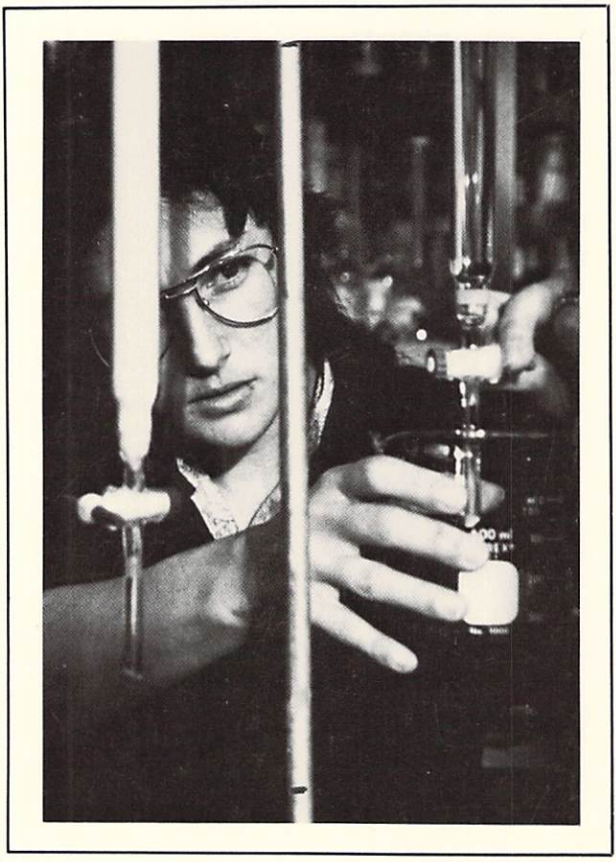
UAA Student Showcase Journal
Recognizing Excellence

Vol. 1 No. 1



University of Alaska, Anchorage

ABOUT THE JOURNAL

The UAA student journal will be published annually. It will consist of a number of research articles and creative works selected from papers presented at the annual *UAA Student Showcase* held in the spring of the year prior to journal publication. An attempt will be made, if possible, to include a wide campus college and/or school representation, as well as papers that will be of value to the community and state.

Copies of the jounal are available for $4.00 from the UAA Student Showcase, Department of Sociology, UAA, 3211 Providence Dr., Anchorge, AK, 99508. For further information call (907) 786-1817 or 1714.

UAA Student Showcase Journal

Vol. 1 No. 1 Spring 1986

University of Alaska, Anchorage

Sharon Araji, Marie Doyle and Donald O'Dowd at luncheon

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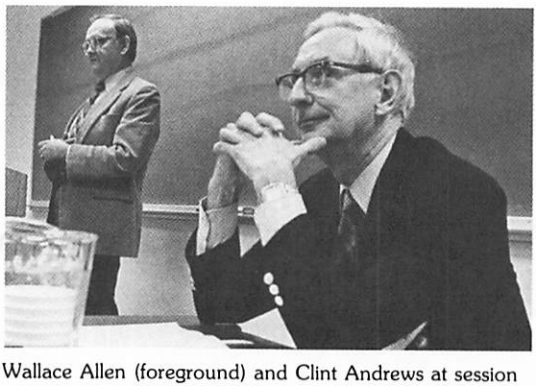

Wallace Allen (foreground) and Clint Andrews at session

UAA Student Showcase Journal
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ABOUT THE CONTRIBUTORS

Brenda Anderson (Murderers vs Non-Murderers: Values and Sex Differences) is a junior who is majoring in Sociology and minoring in Criminal Justice. Her plans following graduation in May 1986 include working at a state agency that focuses on social or legal issues. She also plans, in the future, to attend graduate school in sociology or law school. She enjoys photography, stamp collecting, and camping.

Stacey Beckman (Problems & Progress for the Female Offender: Contrasting Alaska and the Nation) is a senior Justice major with a minor in Journalism/Public Communications. She is currently an editor for the UAA Voice and was recently appointed Chief Justice of the UAA Student Association. In her free time she enjoys various sports and reading. She is a member of Alpha Phi Sigma, and plans to attend law school after graduating in May.

Lawrence Benz (Crime Lab: An Elementary Science Learning Center) has a Bachelor of Arts degree in Biology from Dartmouth College. He is currently working on a teaching certificate in elementary education and is practice teaching in the Anchorage School District. He is listed in the 1986 edition of Who's Who Among Students in American Universities and Colleges, a publication that honors outstanding campus leaders.

Presila DelaCruz (Murderers vs Non-Murderers: Values and Sex Differences) is a senior who is majoring in Sociology and minoring in Criminal Justice. Presila was born in Japan, but is a long-time resident of Alaska. She will graduate in May, 1986 and graduate study is a consideration as part of her future plans. Her interests include skiing, hiking, music, and travel.

Kathe Peratrovich-Dooley (Where's the Doctor?) is a 1985 graduate of the University of Alaska, Anchorage. Her Showcase paper was written when she was a senior, majoring in print journalism, with a minor in art. Her main interest is in feature writing. She is now an executive secretary in the governor's office in Anchorage.

Sandra Eacker (Bear's Song) is presently enrolled in the MFA/Creative Writing program at UAA. She moved to Anchorage two years ago from Portland, Oregon, where she was attending Portland State University as a graduate student in English.

Max Foster (Original Requirements for Southcentral - Interior Alaska Electrical Economy Interchange) graduated from UAA in 1976 with a B.S. in Economics and in 1985 with a M.B.A. He has worked for the Alaska Public Utilities Commission, R.W. Retherford and Associates, General Communications, Inc., and Air Logistics of Alaska, Inc. in several different capacities as a financial and economic analyst, and as an accounting and data processing administrator. He currently owns and manages Computers North, a business oriented computer software firm.

George Grant (Understanding Haiku in Western Culture Plus an Original Haiku Sequence in English) is a graduate student in the Creative Writing program at UAA. He has studied music theory and percussion instruments throughout his college career and received a B.S. degree in Environmental Education from the University of Oregon.

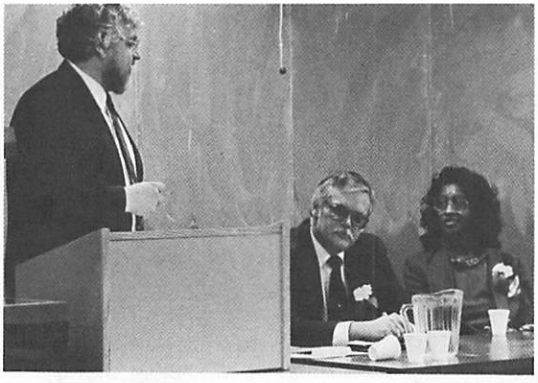
Carolynn Haycox (Toward Expressive Competence: Visual Imagery Enhancement in Mildly Handicapped Six Year Olds) received her master's degree from the UAA School of Education in the spring of 1985. Certified in special education and elementary education, she has taught modified primary classes for several years, and now is a special education resource teacher. She has conducted a number of in-service training classes recently in the use of visual imagery in oral language, reading, and writing development.

Linn Lenoir (Pet Facilitated Therapy in Residential Treatment of Emotionally Disturbed Children) received her BA in Psychology from the University of Guam in 1981. She is now pursuing a M.S. in Counseling Psychology at UAA. In 1985 she was chosen as the Outstanding Psychology Student.

Mauri Long (The Evolution of a Principle: Education & Race in the Alaska School System, 1894-1908) graduated from UAA with a BA in history in May, 1985. She has worked as a consultant to the Alaska Court system. She is a member of Phi Alpha Theta, the international history honor society. In addition to her other talents, she is a marathon runner.

Jesse Owens (The Effects of Paralysis on Development of the Neuromuscular Junction) received a B.S. in biology from UAA in 1983 and is now pursuing a doctorate in Developmental Neurophysiology. He presently teaches biology at the Mat-Su Community College. His extra-curricular interests include photography, woodworking, and metal work.

Debra Sherwood (The Rise and Fall of the Kodiak King Crab Fishery) is a graduate of the University of Oregon with a degree in General Social Science. During 1983 and 1984 she took courses in Journalism at the University of Alaska, Anchorage, where she was enrolled as a senior. Her interests are sports, photography and gourmet cooking, and writing. She is a free-lance writer whose goal is to become a newspaper reporter.



John E. Angell in panel on crime and society

Registration for the Student Showcase

ABOUT THE 1985 UAA STUDENT SHOWCASE

Searching for Excellence: Conference Objectives

Opportunities for intellectual and social exchanges are important functions of universities as they meet many of the developmental needs of students. Such opportunities also provide for the development of a feeling of "group cohesion" and a "sense of belonging" to a particular institution.

Established universities have well-developed structures designed to provide opportunities for intellectual and social exchanges. Universities with shorter histories, such as UAA, however, have few or no such structures to meet the above noted needs. While this problem is partly a function of the youthfulness of such universities, at UAA this has been further complicated by the absence of organized on-campus housing, leading to a "commuter" student population. Institutions with this type of population are characterized by even fewer opportunities for campus-wide intellectual social exchanges and can produce feelings of alienation.

Lack of structual developments, however, does not negate the fact that students should have opportunities for intellectual and social exchanges; such is the purpose of the UAA Student Showcast.

The potential objectives and/or outcomes of such a conference are many-fold. First, it provides a vehicle for meeting intellectual and social needs of UAA students. Second, as the student conference is designed similar to professional conferences, it exposes students to activities that are an important part of the academic lifestyle. Third, the campus-wide effort has the potential of developing closer ties among students, faculty, and administrators. Fourth, public presentations can serve as an incentive for students to exert more creativity and effort in preparing their papers than if they were merely fulfilling a course requirement and receiving a grade. Fifth, by involving community leaders and community members in the showcase, a greater understanding can be gained of the relationship between UAA and the Anchorage community.

- Sharon Araji, Showcase Director

ACKNOWLEDGEMENTS OF 1985 SHOWCASE CONTRIBUTORS

Grants by the University of Alaska Foundation and Students Association, UAA.

Bank of the North - $350 contribution to offset students' and guests' luncheon costs.

The Growing Concern - Large fresh flower arrangements.

Carr's - Corsages for Showcase presenters, discussants, and moderators.

Anchorage Flora Cache (Spenard) - Loaned table arrangements and potted plants.

UAA Vice Chancellor's Contigency Fund - $250 contribution towards the Awards Reception.

SAUAA and Anchorage Visitor's Bureau - Packet stuffers (buttons, pens, maps, ect.).

UAA Public Affairs and Admissions and Records - Conference folders.

UAA Accounting Club - Complimentary coffee and tea during conference sessions.

Heritage Homes - Conference Writing Pads.

Please support the community contributors above who assisted with the 1985 UAA Student Showcase.

Mayor Tony Knowles and Chancellor David Outcault

Bear's Song

Sandra Eacker

Winter has pushed me

against the cave's back wall.

Loose folds of hibernation bunch

up over the bones of my sleep.

Memories branch like secret roots

caught in the thawing earth.

Blood and heart are slow to move;

what the body stored is spent--

huckleberry and fragrant honey,

the quick-flash of promised fish.

I turn toward the growing light,

toward the quickening ache of an earth

about to shake its numb limbs free.

Thanks are extended to Tom Sexton of the English department for his assistance.

Problems and Progress for the Female Offender: Contrasting Alaska and the Nation

Stacey Beckman

The revitalized women's movement heightened America's awareness of institutional sexism. This paper explores sexism in both Alaska's and the Nation's penal systems and examines the effects of sexism on vocational programs, job training and institutional services for female offenders. The paper also examines the progress the two correctional systems have made toward improving opportunities for female offenders.

Stacey Beckman

Men overwhelmingly occupy significant positions in our society. They legislate our laws, minister to our spiritual needs and address our physical and emotional problems. The criminal justice system is also primarily a patriarchal organization. The criminal law has been codified by male legislators, enforced by male police officers and interpreted by male judges. The prison system, for the most part, has been managed by men, for men.

Considering these circumstances it is not surprising that the female offender has been, until the re-emergence of the women's movement, ignored. Some people argue that the "new feminism" is responsible for the rising female crime rate. This contention is debatable, but what is certain is that the women's movement brought attention to the unjust treatment women receive from the criminal justice system. This realization sparked the movement to reform prison programs for women in an attempt to make women's institutional programs as beneficial as men's institutional programs.

Stacey Beckman's research paper was completed for Justice 493, *The Female Offender*, Dr. Nancy Schafer of the School of Justice, Instructor.

This paper will explore the manifestation of sexism in the penal system and the problems and progress associated with attempting to overcome the system's inherent sexism. The analysis of penal reform efforts will focus on national trends and include a specific examination of prison reform progress for women in Alaska, based on the status of the State Correctional Centers in Anchorage and Fairbanks in 1974 and 1983, and the co-correctional facility in Eagle River.

Society's ideas on what a woman should and what a man should be result in grave consequences for women who break the law. The effect these attitudes have on prison programs is devastating for women who are often the sole support for themselves and their children.

According to Sorensen (1981: 62) history reveals that women's prisons (reformatories) of the late 19th century intended to treat, and not punish, so that women would "learn to accept appropriate female role behavior." Sorensen contends that this meant "instilling standards of sexual morality ... and fitting them (women) for duties as mothers and homemakers." Unfortunately, programs like these, which emphasize unmarketable skills as appropriate ladylike behavior, remain consistently prevalent in women's prison programs today.

In "The Female Offender," Gibson (1976: 216) notes that society still considers a woman's primary role to be that of a mother and a homemaker, while her role as a wage earner is considered secondary. These considerations, which stem from sexist ideas of womanhood, result in institutional programs for women that focus solely on traditional concepts of "women's work."

Internalized expectations of feminine behavior are observable in institutional programs designed for the female offender. Society has defined a role for the ideal woman, and this stereotyped role has manifested itself in prison training programs and thus, has limited job and other training opportunities for female offenders. Restructuring programs so the female offender can be self-supporting and independent is a tremendous task because internalized stereotypes are not only present in the penal system but they are also present in inmates. In addition, there are other obstacles to rebuilding useful programs for women. Small numbers of female inmates warrant only a small amount of the correctional budget, and this in turn prevents women from receiving adequate training.

The internalized beliefs of women prisoners themselves present a significant obstacle in the effort to modernize women's prison programs. Thus, many female inmates are not interested in traditionally masculine occupations or trades.

Price (1977: 103) notes that "ambivalence, conflict and resistance always accompany transition" and that women today are experiencing role-conflict because of traditional sex-roles and current opportunities for female advancement.

This seems to be true in the prison population also. Herman (1980: 55) states that the typical female offender, a young, unskilled, single black woman, is simply not used to thinking of herself as a carpenter or "other craftworker long associated with a male image." And Potter (1979: 44) contends that the "prevailing attitude within corrections has been that women offenders yearn only to be cooks, seamstresses, hairdressers and secretaries."

To some extent the above observations are true. Potter cites research from the Federal Bureau of Prisons that reveals that "most women (prisoners) picked clerical, medical and helping professions" (p. 44) as jobs they would like to have. According to Jim Wall, the educational coordinator at the federal prison for women in Pleasanton, California, women are not interested in male-oreinted jobs and as a result, training programs for "male" jobs were dropped when the institution changed from coed to exclusively female. Don Kaye, a classification counselor at the Purdy Treatment Center in West Virginia maintains that most of the women at Purdy are "very passive and not in sympathy with the women's movement. Most of them dream of being a housewife and having children and a man to depend on" (Potter, 1978: 24). Ginsburg (1980: 58) echoes this and states, "my observation is that there are no feminists in county jails ... the typical female offender is traditional and uninformed about nontraditional job options."

However, it must be noted that all women prisoners do not feel this way and that just because the majority appear not to be interested in nontradtional jobs does not mean that all women should be denied the opportunity to significantly expand their skills. Indeed, this is never an issue for men. That is, male vocational and educational programs, by virtue of sexist influence, automatically incorporate useful, well-paying, marketable skills. Women, on the other hand, must justify their desires for these skills. Some women do recognize the economic advantages in pursuing male occupations and are fortunate enough to have access to nontraditonal job training while they are incarcerated. Potter (1979: 44) cites a female student in the nontraditional program at the Bedford Hills Correctional Facility in New York, who stated that "electronics is meaningful work ... the other programs are to pacify the women." Even the most rudimentary from of justice would not deny a privilege to an entire group, based on the sentiments of part of that group.

The difficulty of internalized prisoner role-sets is compounded by the small number of female offenders. Of 438,830 inmates in the United States, 19,019, or almost five percent, are female (Anchorage Daily News, Nov. 7, 1984: J-1). The small number of female offenders often makes nontraditional vocational programs financially unrealistic for exclusively female institutions. Because men are significant in number and have consistent interest in traditionally male training and working programs, they again have access to resources that are rarely offered to women. Price (p. 103) notes that often numbers are so small that

women do not even merit their own institution and consequently end up in a wing or makeshift section of a men's prison, virtually ignored in vocational and other institutional activities.

Potter (1979: 44) observed that the differences between men's and women's vocational programs are abundant. She states that federal prisons for men have vocational courses ranging from autobody repair to computer science, while women at the federal prisons in Alderson, West Virginia and Pleasanton, California are offered the traditional female options like cosmetology, clerical skills and sewing. Potter also states that only four state women's facilities offer nontraditonal vocational training and only one federal prison, Alderson, offers a nontraditional apprenticeship work-release program (p. 45).

Neto's 1981 study indicates that the "basics continue to occupy most women inmates, whether in prison or in jail" (p.69). She states:

> Approximately two out of five women having work assignments in prisons and three out of five in jails are assigned to food service or housekeeping duties. The sewing industry is still the most prevalent form of industiral activity, with 24 of the prisons reporting work duties in this area ... Other work assignments, each accounting for five to eight percent of all inmates, are laundry, clerical, grounds keeping or agriculture, institutional maintenance, data processing and aides of various types. Jails follow a similar but more limited pattern ...

Because of their limited numbers, female offenders do not receive correctional funds for innovative institutional programs and thus, female offenders are stuck with training that leads nowhere.

However, like the internalized role-set problem, the small numbers obstacle is being overcome by people seeking to improve training opportunities for women in prison. Some researchers and correctional surveys indicate that in coeducational or co-correctional institutions, all vocational training programs open to men are also open to women. For example, New York women, who were transferred from the overcrowded Bedford Hills Women's Facility to Albion, an all male facility, benefited from the move by gaining access to all the programs offered to the men (Ginsburg: 58).

The two federal coeducational prisons in Lexington, Kentucky and Fort Worth, Texas have 21 and 18 different vocational options respectively, open to both males and females. It is interesting to note that some men are enrolling in courses traditionally considered feminine, in addition to the women who are seeking training in traditionally masculine jobs (Potter, 1979: 46).

Resistance to women in nontraditional training exists, but it seems to be minimal if the programs have previously been established and if there is guaranteed interest in the programs, as in the coed setting where there is always enough male interest to justify training in the masculine trades. It would be expected that resistance to women participating in established male and coeducational programs is minimal considering that it could be argued that participation denial is illegal under the equal protection clause of the 14th Amendment, which holds, in part, that people in similar situations must be treated similarly, unless the state has a rational basis for treating them differently. Because of the potential equal protection argument, it follows that women's facilities should offer the same opportunities for training as male and co-correctional institutions. As current research indicates, this in not the case.

Fortunately, reform is gradually taking place. As Price (1977: 105) notes, prisons are a "microcosm" of society and as ideas of femininity gradually change, so do programs for female offenders. In her address to the 1980 Congress of Corrections, Alexis Herman, the Director of the U.S. Department of Labor, Women's Bureau, cited the progress that correctional institutions were making in advancing women's programs to the calibre of men's programs. According to Herman (p.54) the emphasis of the Labor Department from 1976 to 1980 was to "obtain better programming for female offenders, in prison and upon release" and to "promote programs that teach skills transferable to the workplace and that command wages adequate to maintain a decent standard of living." Herman's address praises the nontraditional apprenticeship program at Alderson, which was started in 1979, and notes that there are "a total of four federal institutions" (p. 55) that offer nontraditional apprenticeship programs for women. Criticism notwithstanding, this is, of course, progress. However, Herman fails to mention that two of these federal prisons are Lexington and Fort Worth, institutions that offered apprenticeship training for women as early as the mid-seventies. Also, according to Potter's 1979 survey, the federal prison in Pleasanton, California, which was coeducational from 1974-1977, offered women all the nontraditional skills it offered men, until it was turned into a women's prison in 1978. Though it is encouraging to see an institution like Alderson move into the 20th century, it is as equally disheartening to observe deterioration in an institution's offerings because the institution no longer incarcerates men.

Herman's 1980 address states, "... today at Alderson there are now 20 women inmates indentured as apprentices in 12 different trades, mostly nontraditional. I do not pretend to tell you that all aspects of the program are completely worked out ..." (p. 55). She also does not mention that there were 500 women at Alderson in 1979 (Potter, 1979: 48), and this translates into four percent of the female prison population receiving apprenticeship experience.

In fact, it is incorrect to assume a full four percent are receiving training in marketable skills because we do not know what number constitutes "mostly nontraditional" and therefore we do not know how many women really are being exposed to training that will help them get adequately paying jobs. But, in fairness to Herman, in 1979 there were only nine women in apprenticeship programs at Alderson, so it could be said that participation in these programs has more than double in one year. Though true on its face, this is certainly misleading because, even if twenty is a two-fold increase, it is not a significant portion of five hundred.

Still, these reform efforts cannot be overlooked. In fact, female penal reformers have progressed significantly in the past twenty years. A case in point is the extensive 1967 study of corrections in the United States published by the President's Commission of Law Enforcement and Administration of Justice. This 222 page report did not even mention the female offender. Today, due largely to second wave feminism, the female offender is a subject recognized because of her uniqueness as opposed to being considered an aberrant appendage of the criminal justice system.

An analysis of the correctional system in Alaska reveals that the plight of Alaska's female offenders is similar to that of the nation's female offenders. People within Alaska's criminal justice system, having been socialized like everyone else, hold the same prejudicial notions about women and men that carry over into the criminal justice system. And, like the nation, with the rebirth of the women's movement, Alaska has gradually recognized the special needs of female offenders. An examination of Alaska's correctional system between 1974 and 1983 exemplifies Alaska's gradual changes in institutional programs for female offenders.

Like most prisons nationwide, ten years ago the Alaska prison system generally ignored women in terms of vocational and other institutional services. The 1974 Health and Social Services Department of Corrections Catalog reveals discrepancies in services offered for women and men. Scrutinization of this catalog highlights flagrant disparity between opportunities and services like institutional work programs, recreational facilities and activities, and institutional training programs, like vocational education. And, in comparing the 1974 catalog with the 1983 Department of Corrections Annual Report, the obvious conclusion is that Alaska's progress is typical of progress being made on a national basis in women's correctional programs. In Alaska, as in the rest of the nation, women are currently being discriminated against, but the discrimination is not as pronounced as it was in the past.

To exemplify Alaska's gradual progress, this paper will explore the Fairbanks Correctional Center and the State Correctional Center - Sixth Avenue from 1974 to 1983. An examination of the State's newest cor-

rectional facilities, Hiland Mountain Correctional Center and Meadow Creek Correctional Center, will also be undertaken to reveal the State's stagnant movement toward whole-hearted equalization for female offenders.

In 1974, Sixth Avenue's female offenders held typical role-set stereotypes. In Anchorage in 1974 up to 16 "trustees" (HSS Catalog, p. 29) performed institutional maintenance and kitchen duties while women were permitted to work in the laundry section "if desired" (p. 29). From there 6th Avenue's scant resources were evenly divided.

Sports equipment, a Ping-Pong table and table games were available to all persons, and televisions were supplied in each living unit. Outdoor courtyards were open to all persons for "sports and exercise" (p.29) but no ongoing organized recreational activities were supervised.

Today the State Correctional Center - Sixth Avenue still houses male and female misdemeanants (Annual Report: II-7). The recreational facilities have improved and the report lists two "separate black-top courtyards, one for male inmates and one for female inmates" (p. II-7). Within the institution there are television sets, a gymnasium for basketball and volleyball and a weight room with a "wall-mounted weight set, speed bag, body bag, mini-trampoline and exercycle" (p. II-7).

An interesting discrepancy exists in the industrial work program at Sixth Avenue. In 1974 male prisoners were assigned maintenance and kitchen duties, and women prisoners received laundry duties. By 1983, the entire industrial work program had been eliminated for all inmates. The 1983 Annual Report states, "There are no prison industries at the Annex, (Sixth Avenue) nor are any planned due to its pre-trial mission" (p. II-8). Yet, the preceding page of the report states that 90 male and female misdemeanants, pre-trial **and sentenced** are held at Sixth Avenue (p. II-7). Apparently inmates sentenced to Sixth Avenue are post-trial inmates stuck in a facility with a "pre-trial mission." This problem was recognized by the Anchorage Crime Commission in 1982, yet Governor Sheffield's "Transition Task Force on Human Services," which was set-up in May, 1982 in order to provide the Governor with recommendations for corrections, made no mention of the situation at 6th Avenue. This is unsettling because in the Anchorage Crime Commission's "Finalized Summaries, Conclusions and Recommendations," which was published in March, 1982, the 6th Avenue problem is listed as one of ten high priority goals. The report reads in part,

The Corrections system, in its present form, is not responsive to the needs of the community in almost every area of concern. Inadequacies were found in the areas of personnel, facilities, rehabilitation programs, administration and organization (p. 34).

And the sixth goal on the Commission's list of deficiencies reads,

Correctional facilities in the Anchorage area do not have prison industries or work ethic programs which could contribute measurabley to inmate rehabilitation through the development of marketable skills and provide some measure of self-support.

Why did Sheffield's "Blue Ribbin" (Annual Report: I-1) Task Force ignore the Anchorage Crime Commission's recommendation for Anchorage jails? Why are sentenced inmates, male and female, incarcerated in a facility with a "pre-trial mission"?

The facts are that the Department of Correction's Task Force ignored the Sixth Avenue situation and, though the Department of Corrections has done little to remedy the pre-trial/sentenced conflict, they have recognized the importance of institutional programs. It is ironic, then, that little has been done to rectify the situation at Sixth Avenue. Page 30 of the Annual Report reads in part:

> Institutional Programs are necessary in order to provide for the physical, mental, educational and rehabilitative needs of offenders. Current programs include: mental health, substance abuse, education, industries, recreation, chaplaincy ...

Current programs include all these worthy activities, unless one happens to be a sentenced male or female in a pre-trial facility on 6th Avenue in Anchorage, Alaska.

The State Correctional Facility at Fairbanks, now called the Fairbanks Correctional Center, was obviously discriminatory in 1974. The 1983 data on the Center is not gender specific, and as a result the amount of progress Fairbanks has made is not completely discernible.

In 1974 and 1983 the Center held male and female felons, misdemeanants and pre-trial and sentenced offenders (p. II-1). The institutional work-program accommodated up to 30 adult men in 1974. The men worked in various trustee programs, including "general maintainence (sic), grounds work, and food preparation" (HSS Catalog: 36). Today, Fairbanks, like Anchorage, offers no institutional work program, so women have gained nothing in that respect in ten years, while men lost the service. The 1974 recreational activities offered in Fairbanks, like the 1974 Anchorage recreation facilities, were overwhelmingly sexist. The 1974 catalog reads:

> The Center staff supervises a city league baseball and basketball team (men only) and there is also an active Toastmaster club for adult men only ... (p. 36)

Women were allowed to participate in more sedate programs like "sewing and arts and crafts" (p. 36).

In 1983 recreational facilities included a full-size gymnasium, weight lifting equipment, pool table, trampoline, and volleyball and basketball equipment (Annual Report: II-1).

From this information it is difficult to determine the extent of female participation in the institution's recreational activities. Assuming they are allowed at least minimal access to these facilities, since this is the law, they are better off than they were ten years ago.

An excellent example of Alaska's current posture on incarcerated women is evident in the co-correctional facilities at Eagle River. The two institutions, Hiland Mountain and Meadow Creek, are connected via an enclosed walkway, so the inmates have easy access to each other's facilities. Two offensive differences between Meadow Creek and Hiland Mountain are their recreational facilities and their vocational programs.

The men's facility has a regulation size gymnasium and a weight room, in addition to a "hobbycraft room, used for wood-working, soapstone carving, and lapidary" (Annual Report: II-13). The women's recreational facilities, on the other hand, consist of an "exercise room" (p. II-16) and the report notes that "Meadow Creek residents have access to the full-sized gymnasium at Hiland Mountain for one and one-half hours each day" (p. II-16).

Though one and one-half hours is hardly equal access to the gymnasium, it is better than complete exclusion. On paper we can recognize this as progress; however, women who do want to use the gym are hesitant because of the oral "harassment" they are subject to from the Hiland Mountain inmates (Class Speakers, October 17, 1984).

Sexism has also manifested itself in more traditional ways at Hiland Mountain and Meadow Creek. Men use their "hobbycraft" room for woodworking and carving, in addition to ceramics, while women use their "arts and crafts" room for ceramics and painting. Men are offered no "traditional vocational programs such as machine shop and construction trades due to lack of space, equipment and full-time instructors" (p. II-13). Women, however, get vocational training in bookkeeping, accounting, typing, computers and food service (p. II-16). Since the catalog does not indicate that these "women's trades" are also open to men, it can be assumed that normally they are not. Similar to incarcerated men in the rest of the nation, Alaskan males are also limited by society's idea of what is appropriate masculine behavior.

Neither Hiland Mountain nor Meadow Creek currently have prison industries. However, the groundwork has been laid for a park furniture industry at Hiland Mountain (p. II-15) and it is "anticipated that Meadow Creek residents will participate in any industries developed at Hiland Mountain" (p. II-17). Nationally, this is also the case. If men get indutrial programs that women have easy access to, women are allowed

to participate in them. This is encouraging since, as previously noted, denying women access to these services constitute grounds for an equal protection argument. However, statements and promises like this must be examined skeptically. As previously noted Meadow Creek women have access to the Hiland Mountain gym, but this access is void because women who want to use the facility do not do so to avoid oral harassment. In other words, facts on paper are not always reality.

A constant theme in feminist writing from Wollstonecraft to Goldman and beyond concerns the contradictions which are inherent in society regarding femininity and masculinity. Contemporary feminist issues concern confronting the contradictions which inhibit women's abilities to survive in a world defined by men. Even today, after feminist writings and campaigns have resulted in some significant legislative and social victories, women are constantly confronted with disparity. The progressive effects of the women's movement have been minimal. This is especially evident in observing the plight of the female offender.

Though reform of prison programs for women in the United States is gradually taking place, American women are still subject to prison programs that do not adequately prepare them for an independent existence. Alaska's female offenders face virtually the same obstacles that female offenders face nationwide. All female offenders confront unique problems in challenging the patriarchal criminal justice system. Because women have also internalized sexist system values, they are often unaware of nontraditional options. Also, female offenders only comprise five percent of the prison population and thus, they are easy to ignore when program funding is taking place.

This paper has only briefly explored some of the obstacles that confront incarcerated women and has just touched on progress that is being made on behalf of the female offender. Though sometimes slight, and always slow, this progress cannot be disregarded, because as long as women are moving forward, no matter how slow and slight, they will be breaking barriers that block equality, the fundamental assumption of all free people.

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Murderers vs Non-Murderers: Values and Sex Differences

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The purpose of this research was to compare convicted murderer's values with those of people who, to the best of our knowledge, had never murdered, and to determine if sex differences existed with respect to value rankings. The theories that guided the study were Rokeach's value theory and theories of sex role socialization. Data were gathered using Rokeach's value survey (1967), as well as a short questionnaire. The instruments were administered to a convenience sample of convicted murderers in an Alaskan correctional institution and to a demographically matched sample of non-murderers. It was hypothesized that murderers' values would be substantially different from those of the non-murderers, and that male and female values would differ from each other. The findings show some support for the hypotheses. Application of the research findings to policies focusing on rehabilitating criminals or preventing criminal behavior is discussed.

Introduction and Statement of Purpose

Studies by Allen (1980), Sorrell (1980), and Wolfgang (1967) suggest that murderers may have values that guide them toward violent behavior and the acceptance of killing. For example, Allen (1980) examined secondary data and outlined the characteristics that profile a high probability towards homicide. Sorrell (1980) looked at juveniles who commit homicides in order to identify factors that influence their behavior. Finally, Wolfgang (1967) suggests that murderers may have values that guide them toward violent behavior. These studies also suggest that murderers' values differ from those of non-murderers.

In the present study, murderers are defined as "individuals who have killed another person and have been convicted and placed in a criminal correctional institution." Values are defined as "an ethical principle to which people feel a strong emotional commitment and which they employ in guiding and judging their behavior." Values also provide us with our conceptions of good and evil (Vander Zanden, 1984).

Three theories will guide the present research: Rokeach's value theory, which assumes that values are important in guiding people's

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behavior; reference group theory, which focuses on the various groups that people use to evaluate their behavior; and social learning theory, which emphasizes the importance of socialization in shaping sex roles and sex-typed behaviors.

Studies have shown that due to sex role socialization, males and females tend to have differing values and behavior. Men and women tend to internalize acceptable value systems and certain types of acceptable behavior for their gender. Boys, for example, are expected to be aggressive, loud, and independent. Girls, on the other hand, are to be passive, emotional, and illogical (Basow, 1980:6).

Considering the previous discussion as a whole, the purposes of this research project are two-fold: 1) To compare the similarities and differences of convicted murderers' values with those of people who report they have never murdered; and, 2) to determine if the value systems of the males and females in this study vary.

Theories

Rokeach's value theory serves as the basic theoretical perspective of this paper. Rokeach (1973) defines a value as an "enduring belief that a specific mode of conduct or end state of existence is personally or socially preferable to an opposite or converse mode of conduct or end state of existence." This theory assumes that values are related to and guide people's behavior. Specifically, Rokeach equated values with beliefs, and states that these beliefs transcend attitudes toward objects and situations. Values are the standards that guide and determine actions, attitudes, ideology, presentation of self to others, evaluations, judgements, justifications, and comparisons of self with others, in an attempt to influence others. Rokeach bases this theory on five basic assumptions about the nature of human values: 1) the total number of values a person possesses is relatively small; 2) all indiviudals possess the same values to a different degree; 3) values are organized into value systems; 4) antecedents of human values can be traced to culture, society and its institutions, and personality; 5) the consequences of human values will be manifested in virtually all phenomena (Rokeach, 1973:3). On the basis of this theory, if values or value systems are prevalent in determining persons' actions and behavior or attitudes, then we assume that the values of persons who commit crimes such as murder must somehow differ from those who do not.

Social learning theory is also important in guiding the present study. This theory emphasizes conditioning in the acquistion of values, attitudes and behavior. Studies based on this theory have shown that children are usually rewarded for modeling behavior of the same sex (Vander Zanden, 1980). Social learning investigators have contributed

some very impressive laboratoy experiments that demonstrate the power of reinforcements in the shaping of behavior, in particular, sex-typed behavior. Social learning theory also highlights the importance of imitation, especially of significant others, in the acquistion or socialization of sex roles (Hyde and Rosenburg, 1976:48). That is, society socializes men and women to play their sex roles differently. Men are traditionally socialized to place higher value on achievement, intelligence, and aggression; while women are socialized to place higher value on love, affiliation, and the family (Basow, 1980:76). Therefore, since the socialization of the sexes is different, we should expect that males and females will have different value systems - i.e., that they will rank values differently.

Reference group theory states that a person's reference group is "a group to which the person refers to when making evaluations of himself and his behavior" (Robertson, 1977:163). We evaluate our behavior, our appearance, our ambitions, our lifestyles and our entire value system by referring to some group. Reference groups can include primary groups like the family, peers, and work groups. Sorrell (1980) suggests that violence is learned through reference groups like gangs.

Review of Relevant Literature

A search of the literature relevant to our research revealed that there were some studies that focused on attitudes and values of murderers. To the best of our knowledge, we have not found any studies that specifically address the purpose of this study - i.e., a comparison of the similarities and differences of the values and value systems of murderers and non-murderers. A number of studies have been written, however, about value differences, backgrounds, and some attitudes of homicidal people, as well as a large number of studies that address the differences of values between the sexes.

Factors Conducive to Murder

Sorrell (1980) discusses juvenile homicide. He studied juveniles who had been charged with homicide in Alemeda County, California in 1973-74, and compared neighborhoods in which these homicidal juveniles lived. He found that juveniles who committed murder tended to come from communities and backgrounds where life is not highly valued. He also discovered that these homicidal juveniles also came from violent, chaotic families. A reference group theory would suggest that the values of a person's reference, or primary group (i.e., family, gang, peer group, ect.), influence his/her values. Sorrell (1980) assumes that when a child is exposed to violence early, especially in their primary group, they are socialized to consciously view violence as

an acceptable behavior, especially when dealing with interpersonal conflicts (Sorrell, 1980:152-161). This study also suggests murderers' values would be more related to violent behavior than would non-murderers.

Stonehouse (1979) employs Kohlberg's theory of moral development, which is based on Piaget's study of cognitive development. In this discussion, there is the assumption that how much an indiviudal values others as people is dependent on the moral development of that individual. Kohlberg has identified three levels of moral development; at the first level "others" are valued in material terms, persons are valued according to what they can do for me; at the second level, "others" are valued in relationships of affection and for their contribution to society; and the third level is reached when "others" are valued because they are people, when human life is considered sacred. It was suggested by Stonehouse (1979), that murderers have never attained the second or third level of moral development. A conclusion we reached after reading this acticle is that people who have a low value of others, especially when valuing them as a means to achieve their personal goals, are more likely to commit murder than people who highly value people. Values that relate to achieving personal goals and satisfaction will also be of more importance to murderer's than those that relate to the social welfare of others.

Allen (1980) used data collected by agencies such as the California State Health Department, FBI Uniform Crime Reports, State of California Department of Justice, and local police reports and records, as well as psychological, social, and environmental data to outline a profile that characterizes "high probability towards homicide." She concludes that poor parent models, characterized by family discord, severe deprivation and instability, are important primary factors in the making of criminals. Children exposed to violence learn and are conditioned to the idea that killing is an acceptable way to resolve conflict (Allen, 1980:44). Here again is the suggestion that people learn and accept the values of their primary or reference groups, and these values would be related to acts that reflect violence. We assume these values would be related more to achieving personal satisfaction than values that consider the welfare of others.

Wolfgang, a sociologist at the University of Pennslyvania, reported the following findings in his book:

> There seems to be a conflict between the prevailing middle-class values of our society and values of subcultural or subsocial groups. This group constitutes the subculture of violence... the greater the degree of integration of the individual into this subculture, the higher the likelihood that his behavior will often be

> violent; or we may assert that there is a direct relationship between rates of homicide and the degree of integration of subcultures of violence to which the individual belongs (Wolfgang, 1967:27).

Statistices show that the violent offender is characterized as being young, male, a minority, and having a low income and low education (Department of Justice, 1982). Quick to resort to physical violence as a measure of daring, courage or defense appears to be a cultural expression, especially for the lower socio-economic class. When such a cultural norm response is elicited from an individual engaging in social interaction with others who share the same response mechanism, physical assault, domestic quarrels, and other altercations that result in homicide are apt to be more common (Wolfgang, 1967:132).

Class also plays an important part in determining value structures. Middle class families give higher priority to values that reflect internal dynamics. Specifically these include happiness, consideration for others, and curiosity. Lower class families, by contrast, give higher priority to values that reflect behavioral aspects. These include the ability to defend him or herself, obedience and neatness. The middle class focuses on the internal processes of self-direction and emphathic understanding, while the lower class focuses on conformity to externally defined standards (Kohn, 1969).

With this information, we can assume that murderers are more likely to come from violent subcultures, families, peer groups, gangs, and have values similar to these subcultures since their behavior is violent. Sorrell (1980) reports that violent subcultures and their members hold different values than the average societal member. Violent groups and their members that murder, hold values that are more likely to make violence, or killing, an acceptable behavior. While Sorrell (1980) does not identify these values, we assume that murderers would place greater emphasis on values such as courage, pleasure, an exciting life, imagination, and freedom, and less emphasis on values such as equality, a world at peace, a world of beauty, family security, broad-mindedness, forgiving, helpful, loving, self-control, polite, obedient, and responsible.

Value Differences Between Males and Females

In 1968, Rokeach adminstered the Value Survey to a national sample drawn from all strata of American society. Based on data from this survey, he reports the following about the values of American men and women:

> Both sexes ranked at the top of their terminal hierarchy of values a world of peace, family security, and freedom, and at the bottom, an exciting life, pleasure, social recognition, and a world of beauty. At the top of the instrumental value hierarchy for both sexes are honest, ambitious, and responsible, and at the bottom are imaginative, obedient, intellectual, and logical. Concerning sex differences... the largest terminal value difference is found for a comfortable life, which men ranked fourth and women ranked thirteenth. The largest instrumental value difference is found for imaginative, which is significantly more important to men. Men also place significantly higher value than do women on an exciting life, a sense of accomplishment, freedom, pleasure, social recognition, ambitious, capable, and logical. Conversely, women value significantly more than do men, a world at peace, happiness, inner harmony, salvation, self-respect, wisdom, cheerful, forgiving, and loving (Rokeach, 1973).

Rokeach believed the differences in values are due to the differences in the way men and women have been socialized in our society. He says:

> Men, the traditional breadwinners, are more materialistic, achievement and intellectually oriented. They are at the same time more pleasure seeking than women. Women, on the other hand, seem more oriented toward religious values, personal happiness, love, self respect, and a life free of conflict (Rokeach, 1973:59).

Rokeach contends that as long as there are differences in males and female sex roles, there will be differences in male and female value patterns.

Hypothesis

Based on the above discussed value theories of sex-role socialization, reference group theory, and the review of relevant literature, we hypothesize the following:

1. Murderers' values will differ from the values held by non-murderers. Specifically, murderers will place greater emphasis on values that relate to personal satisfaction, such as pleasure, independent, a comfortable life, an exciting life, and happiness, than on social

values, such as a world at peace, equality, freedom, helpful, honest, and polite.

2. Due to traditional sex-role socialization, there will be differences in values between males and females, regardless of whether they are murderers or non-murderers.

3. Due to the fact that the murderers are in prison and thus have now interacted with other criminals, we hypothesize that there may be differences between male murderers and non-murderers and female murderers and non-murderers.

Research Methods

A convenience sample of ten murderers was obtained from a correctional institution in Alaska. It consisted of five males and five females, ranging in age from 24 to 65 years of age. Each person was given a value survey (Rokeach, 1967) with two lists of 18 alphabetically arranged instrumental and terminal values. Each value is presented along with a brief definition in parentheses. Respondents were to arrange the values in order of personal importance as guiding principles in their life. Each subject voluntarily completed these surveys.

After the demographic characteristics of age, sex and race were obtained for the murderers, the value survey was administered to a convenience sample in the general population (who, to the best of our knowledge have never committed a homicide), having approximately the same demographic characteristics of the murderers -- thus, we attempted to achieve a matched sample. We were able to get permission to obtain the demographic information of the murderers by having one of the researchers in the original project who is employed by the correctional institution in our study, pull needed data from murderers' files. Our "non-murderers" sample consisted of acquaintances of the research team, who agreed to voluntarily complete the surveys.

We collected all surveys, tabulated all the value rankings, and separated the groups according to sex and whether they were murderers or non-murderers. Then we obtained the rank ordering of the values on the survey for each group by computing the median rankings. This gave us a composite rank order for each group. In order to determine where substantial differences existed between groups, an arbitrary decision was made to consider four or more differences in the rankings of values as a substantial difference (see tables 1 and 2 for statistics on value rankings - pp. 34 and 35).

Findings

Table 1 shows the composit rank ordering of the values of murderers in our sample as compared to the values of non-murderers. As can be

seen, the values that substantially differentiate murderers' values from non-murderers' values are: the terminal values of equality and salvation, and the instrumental values of broadminded, clean, helpful, polite, and self-controlled. (Reminder: a substantial value difference is defined for this study's purposes as a ranking distance of four of more ranks between values.) Murderers in our study ranked salvation, clean, polite and self-controlled higher than our sample of non-murderers, and murderers ranked equality, broadminded, and helpful lower than the non-murderers.

These findings are both consistent and inconsistent with our predictions. On the whole, however, we found that there were more similar rankings between the groups of murderers and non-murderers than differences. Both groups ranked the instrumental value of honest and the terminal value of freedom as number one. Other similar rankings were: a comfortable life, an exciting life, family security, happiness, self-respect, social recognition, wisdom, ambitious, imaginative, independent, obedient and responsible.

Table 1 is also broken down by sex. A few value differences that substantially differentiate the sexes are: the terminal values of equality and salvation, and the instrumental values of courageous, intellectual, and logical. It is interesting to note that we found more substantial value differences between the men and women than we did between the murderers and non-murderers. It can be seen in the murderers/non-murderers grouping (Table 1), that there were seven substantial differences. In the male/female groupings, however, there was double that - 15 substantial differences. We found that both sexes tended to select similar values as their most important ones; i.e., both sexes ranked freedom and honest number one, (as did the murderer/non-murderer groups), and responsible number two. Independent was numbered three and loving number four. The most significant differences were the rankings of logical (men ranked it at a high of five, while women ranked it at a low of 17) which was a 12 rank order difference. Courageous (men ranked it at 16, women ranked it high at six) had 10 rank-order differences, and for equality (men low 15, women high six), there was a nine rankings difference.

Tabel 2 shows our findings with respect to the values of male murderers compared to male non-murderers. The substantially different value rankings were found for the terminal values of world of beauty and wisdom, and the instrumental values of ambitious, cheerful, courageous, helpful, independent, loving and self-controlled. Male murderers as compared to male non-murderers ranked the terminal values of a world of beauty, seven to 17; and wisdom, one to five; and the instrumental values of ambitious, six to 17; independent, one to five; and self-controlled, four to 15; substantially higher than their counterparts. And male murderers ranked the instrumental values of

cheerful, 15 to eight; courageous, 17 to 12; helpful, 16 to four; and loving, seven to two; substantially lower than male non-murderers.

Table 2 is also a comparison of the value rankings of female murderers and non-murderers. Our findings showed many substantial differences between these groups. Here the substantial differences appeared to concern the value rankings of the terminal values of a sense of accomplishment, equality, inner harmony, salvation, true friendship, and wisdom, and the instrumental values of ambitious, broadminded, clean, courageous, forgiving, imaginative, independent and intellectual. The most significant differences are for independent (murderers rank it lower than non-murderers, nine to one), ambitious (murderers ranking it higher than non-murderers, four to 12), clean (female murderers ranking it higher than non-murdering females, seven to 18), and salvation (female murderers again ranking this substantially higher than non-murderers, five to 17). In this comparison we also found that both groups rank the values of freedom and honesty as their most important values.

Discussion

Based on Rokeach's value theory, theories of sex-role socialization, reference group theory and a review of relevant literature, we hypothesized that:

1. Murderers' values will differ from the values held by non-murderers. Specifically, murderers will place values that relate to personal satisfaction higher than social values; and
2. Due to traditional sex-role socialization there will be differences in values between males and females; and
3. Due to the fact that the murderers are in a prison environment, there may be differences between male murderers and male non-murderers and female murderers and female non-murderers.

Findings from the data collected offered some support for our first hypothesis, that murderers' and non-murderers' values will differ. We observed seven substantial value ranking differences between the murderers and the non-murderers. We found, as hypothesized, that murderers would rank equality, broadminded and helpful lower than the non-murderers. This supports our first hypothesis which stated that murderers will place values which relate to personal satisfaction higher than social values. Since we view equality (brotherhood, equal opportunity for all), broadminded (open-minded), and especially helpful (working for the welfare of others) as social values, we see this as supporting the hypothesis because murderers in this study rated these values substantially lower than non-murderers.

Our findings also offer some support for the third hypothesis. There were 14 substantial differences between the female murderers and the female non-murderers, and there were nine substantial differences between the male murderers value rankings and the male non-murderers value rankings. This suggests that the prison environment may have some effect on changing people's values. However, we cannot really tell that for sure in the present study.

Our evidence in this research lends support to our first hypothesis, but we realize that we must take into account that there are also many similarities in the rank ordering of these groups. Our data shows that all the groups, (murderers, non-murderers, females and males) on the average, rank similarly their most important values. That is, the sample groups, whether male or female, murderers or non-murderers, ranked freedom, honesty, family security, and responsible as their most important values. This is similar to Rokeach's findings in his studies of values (1973). Thus, this seems to indicate that our sample, whether or not they are male or female, non-murderers or murderers are like the normal population. It is important to notice this occurrence of similarity in the top ranking values, because we feel these groups reflect the cultural values, in this case, the U.S. values. Through our socialization and acculturization, we learn and accept the values of the society to which we belong.

In the second hypothesis we predicted male and female value differences.

There were a total of 15 substantial differences in rankings of values between the sexes. As we have discussed before, sex-role socialization may be the cause of these differences of values between men and women. Not only do we learn and internalize our cultural values through socialization, but we also learn and internalize our sex-roles and the values that are attributed to our sex.

In our study, an interesting factor in the values of women appeared. Within the rankings of our sample of females, both murderers and non-murderers, there is an emphasis on values that can be equated with the women's movement and the changing of sex-roles. In our study, the women ranked equality, ambition, and courage much higher than the men. And the men ranked helpful, true friendship, mature love, happiness, world of beauty and comfortable life much higher than the women. We believe these values may indicate the changing in sex roles. Traditionally men are socialized to place higher value on achievement and intellecutal pursuits; while women are socialized to place a higher value on love, affiliation and the family (Rokeach, 1973). But as women's roles and men's roles change, so will the values, maybe even becoming equal when the roles become equal. We found, however, that most of the more important values were similar for both sexes. But, as long as there is a difference in sex roles and the socialization of men

and women, there will probably be differences in the value rankings of men and women.

Policy Implications

Although we suggest that much more intensive research should be done, the knowledge of human values presented in this paper may be a resourceful aid in criminal prevention, reintegrating or rehabilitating violent persons.

Keeping in mind the very small sample, correctional programs can use this information about the values of murderers to design a study similar to ours and expand it to include a larger population and use more sophisticated statistical analysis in order to gain a better understanding of the values of violent offenders. We see these offenders as reflecting a more "self" than "other" orientation. Since we found that murderers have a high ranking for their values of personal satisfaction, if we are able to change a person's values so he/she ranks social values (those that have to do with helping, caring, sharing, loving and protecting others) higher than or equal to personl values (self oriented values), then maybe we will be able to change their violent behavior. Rokeach (1973) would agree with this as he sees values as very important in determining persons' actions or behaviors.

We can also use this information for raising children, since it is in primary groups that we seem to learn to become violent. We could teach the children and socialize them so that they have the values that will promote social, rational, and humane behaviors so they will have a lesser chance of being violent and thus, maybe becoming a murderer.

The best way in which the information in this paper can be utilized in the criminal justice system is to do further research into human values that may influence criminal behavior. The present authors look forward to doing this in the future.

Conclusion and Directions for Further Research

In this paper we have collected and compared the values of a selected sample of murderers and non-murderers of both sexes. With the use of Rokeach's value theory, sex-role socialization theories, and a review of relevant studies and literature relating to the subject of human values, we hypothesized that murderers' values would be substantially different from those of non-murderers, and that male and female values would differ from one another. Our findings tended to support both our hypotheses to some degree. Our data showed that murderers substan-

tially ranked personal values such as inner harmony, salvation, and clean higher than social values such as helpful, national security, equality, a world of beauty and a world of peace.

We found women and men ranked 15 values substantially different. As long as there is sex-role socialization, there will most likely be value differences between the sexes. However, we did note changes that may reflect the influence of the women's movement, although Baldwin (1983) indicates this liberation has had little effect on women becoming criminal. Nevertheless, males are placing a higher value on love, affiliation and family, and females are placing a higher value on achievement and intellectual pursuit. This is quite different from Rokeach's findings back in 1968. It may, however, reflect socialization or effects of peer groups in the prison. Due to the smallness of our sample, however, a much larger sample and more sophisticated research must be done to draw any strong conclusions about the population and their role in socialization.

Our suggestion for future research would be to look more closely at socialization, which was beyond the data available to us. It is through socialization that we obtain our values. Thus, we suggest that future researchers gather information about reference groups and primary groups of the sample. It is in these groups that socialization takes place and the learning and internalization of value systems begin. Another variable we feel is important in researching this subject is culture, because culture influences values and value rankings.

Our last suggestion for future research is to use more sophisticated statistical methods. As students, we have not yet become familiar with more advanced statistics that could be applied to this study.

In conclusion, we have learned a great deal about human values through this research. It is our hope that others will also gain a better understanding of human values and the similarities and differences in value rankings between the groups researched in this paper.

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Table 1. Terminal and Instrumental Value Differences by Sex and Murderers/Nonmurderers

TERMINAL VALUES	Murder: Murderers n = 10	Murder: Non murderers n = 10	Sex: All Males n = 10	Sex: All Females n = 10	INSTRUMENTAL VALUES	Murder: Murderers n = 10	Murder: Non murderers n = 10	Sex: All Males n = 10	Sex: All Females n = 10
A comfortable life	10	11	8	13*	Ambitious	6	6	12	8*
An exciting life	12	12	10	14*	Broadminded	9	5*	6	9
A sense of accomplishment	11	10	11	8	Capable	8	10	8	10
A world at peace	13	14	14	11	Cheerful	11	8	13	11
A world of beauty	14	17	12	17*	Clean	7	18*	17	12*
Equality	15	7*	15	6*	Courageous	12	9	16	6*
Family security	3	2	2	3	Forgiving	13	11	11	7
Freedom	1	1	1	1	Helpful	17	7*	10	15*
Happiness	4	4	3	7*	Honest	1	1	1	1
Inner harmony	5	8	6	5	Imaginative	15	14	15	13
Mature love	7	9	5	9*	Independent	5	4	3	3
National security	18	15	16	18	Intellectual	16	13	9	16*
Pleasure	16	13	13	15	Logical	14	16	5	17*
Salvation	9	16*	17	10*	Loving	4	2	4	4
Self-respect	6	5	9	4*	Obedient	18	17	18	18
Social Recognition	17	18	18	16	Polite	10	15*	14	14
True friendship	8	6	7	12*	Responsible	2	3	2	2
Wisdom	2	3	4	2	Self-controlled	3	12*	7	5

* A significance denotes a difference of four or more value rankings.

Table 2. Terminal and Instrumental Value Differences: Murderers vs. Nonmurderers by Sex

TERMINAL VALUES	Murderers n = 10 Males	Murderers n = 10 Females	Nonmurderers n = 10 Males	Nonmurderers n = 10 Females	INSTRUMENTAL VALUES	Murderers n = 10 Males	Murderers n = 10 Females	Nonmurderers n = 10 Males	Nonmurderers n = 10 Females
A comfortable life	10	12	7	11*	Ambitious	6	12*	17	4*
An exciting life	11	13	10	13	Broadminded	8	11	7	5
A sense of accomplishment	12	11	12	6*	Capable	9	10	11	8
A world at peace	13	10	14	12	Cheerful	15	8*	8	11
A world of beauty	7*	17	17	15	Clean	13	7*	16	18
Equality	15*	9	13	3*	Courageous	17	4*	12	9
Family security	3	2	3	5	Forgiving	12	3*	9	12
Freedom	2	1	1	2	Helpful	16	14	4	15*
Happiness	4	7	2	7*	Honest	2	2	1	2
Inner harmony	6	4	8	8	Imaginative	14	15	14	10*
Mature love	5	8	4	10*	Independent	1	9*	5	1*
National security	17	18	15	18	Intellectual	10	18*	10	13
Pleasure	14	15	11	14	Logical	5	17*	6	14*
Salvation	16*	5	16	17	Loving	7	6	2	6
Self-respect	9*	3	9	4*	Obedient	18	16	18	17
Social Recognition	18	16	18	16	Polite	11	13	13	16
True friendship	8*	14	6	9	Responsible	3	1	3	3
Wisdom	1*	6	5	1*	Self-controlled	4	5	15	7*

* A significance denotes a difference of four or more value rankings.

Crime Lab:
An Elementary Science Learning Center

Lawrence Benz

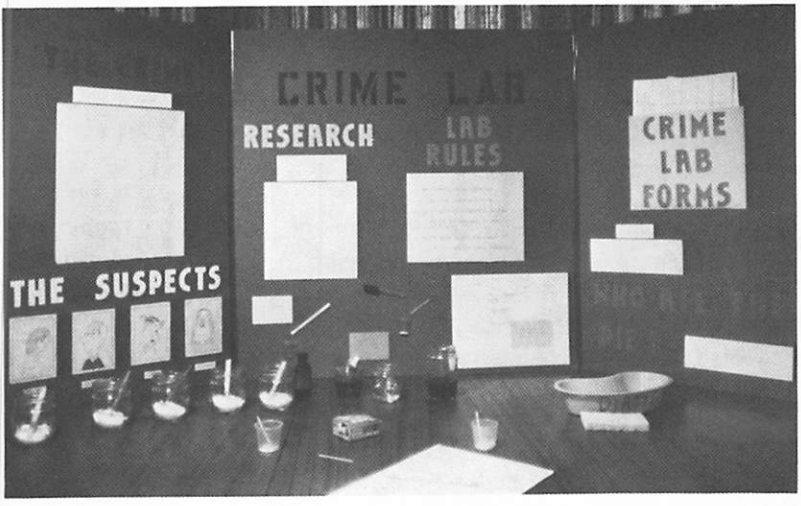
A learning center is a place in the classroom where students are provided learning experiences in the form of individual or group activities. It is a place where one or more students direct themselves or are directed by the teacher toward the pursuit of learning. Through learning centers, children can be involved in activities ranging from hands-on experiences to research projects. If properly planned and constructed, learning centers motivate, support, guide and reinforce children's learning. They are essential in classrooms where children are engaged in hands-on activities.

Science is a content area in the elementary school that lends itself particularly well to the utilization of learning centers. "Crime Lab" is a fifth grade science learning center. This center focuses on developing science processes (observing, inferring, predicting, measuring, etc.) through a unique elementary chemistry lesson. It is adapted from the Elementary Science Study unit known as "Mystery Powders." "Mystery Powders" involves the investigation of known and unknown white powders. Students perform various "tests" using water, vinegar, iodine, and microscopes to determine the characteristics of known powders and then use this information to identify unknown powders or a mixture of unknown powders.

Crime Lab's major objective is for the students to determine the identity of an imaginary thief by performing various tests on traces of foot powder left by the thief. There are four suspects who each use a different type of foot powder. The thief left traces of his foot powder near the scene of the crime. The student's task is to perform various tests on the traces of the thief's foot powder. The student then performs the same tests on all four suspects' foot powders. When the student finds the suspect's foot powder that matches the thief's foot powder, the crime is solved.

This learning center provides an exciting way for the students to practice the scientific method and see the importance of good record keeping. The overall goal of this learning center and others like it, is to provide activities for elementary students that will make them more comfortable with science.

Lawrence Benz's project was completed for ED 404, *Teaching in Elementary Schools*, Dr. Donna Gail Shaw, Instructor.



Lawrence Benz's "Crime Lab"

The Evolution of A Principle: Education and Race in the Alaska School System, 1894-1908

Mauri Long

The extension of civil government to Alaska in 1884 included a provision for a federal school system. The phrase "without regard to race" in the act was interpreted to mean separate schools for both white and native children. The Nelson act in 1905 continued this system of segregated schools on a more formal basis. When several "civilized" native children were denied entry to the federal white school in 1906, they brought suit. The Alaska district court upheld the segregation of the schools, thereby denying equal educational opportunity to Alaska natives, even those who were well assimilated.

The development of Indian education in Alaska was unique in two ways when compared with Indian education in the rest of the United States. First, unlike Indian education in the contiguous states, the education of Alaska Native children was made the responsibility of a small Interior department agency, the Bureau of Education, rather than the Bureau of Indian Affairs, which had jurisdiction over Indian education elsewhere. Second, education of school aged children in the territory was to be provided "without regard to race." a phrase which might have been interpreted to mean that Native and non-Native children should attend the same school, but which in fact was interpreted to mean that the Bureau had the responsibility to provide schools for both Native and non-Native children. In point of fact, separate, segregated schools were provided for each racial group.

The education of Alaskan children by the United States government began with the territory's first organic legislation, passed by the U.S. Congress on May 17, 1884 (U.S. Statutes, 1884). Section 13 of that act required the Secretary of the Interior to "make needful and proper provisions for the education of the children of school age in the Territory of Alaska, without reference to race." In 1885 Congress appropriated $25,000 for that purpose, an inadequate sum. And thereafter, yearly appropriations averaging $30,000 were made. These, too, were insufficient to meet the needs of the Alaskan populace.

Thanks are extended to Drs. Will Jacobs and Steve Haycox of the History department for their assistance.

It seems that Congress had little comprehension of the tremendous size of the territory, or the difficulties of travel between small population centers. And since Alaska had no representation in Congress until much later, Congressional ignorance of the needs of Alaska's population contributed to the problem of insufficient funding of the school system, despite repeated requests by the governors of Alaska, and the "General Agent of Education."

In 1885 the U.S. Bureau of Education appointed Presbyterian missionary Rev. Sheldon Jackson as general education agent. Prior to his appointment, Dr. Jackson had spent several years organizing and establishing missions and schools in Native villages in Alaska. His vocal concern for the welfare of the Natives of the territory had led him to deliver a seris of lectures on Alaska, and helped secure passage of the first organic act (Marsh, 1967). The schools established in Native villages were, perforce, schools exclusively for Native children. With the appropriation from the organic act, Jackson established schools in Sitka, the temporary seat of government and a white town with a large Native population, and in Juneau and Unalaska, towns with white and Native populations. More schools would follow in other Alaska towns, both those with mixed populations, and those which were exclusively Native.

Although there were sufficient developments in the intervening years, a second major event in the development of education in Alaska came in 1900, when the Fifty-sixth Congress passed legislation authorizing the incorporation of towns within the territory (U.S. Statutes, 1900). This act transferred control of schools in Alaska to the local citizenry in the towns by providing for the election of three-member school boards which "would have exclusive jurisdiction of schools within the municipalities" (Gruening, 1954). Schools established in the newly incorporated towns would be supported by 50 percent of the licensing fees collected from businesses and liquor sales within the municipal boundaries. The fee collection scheme was a major departure from reliance on Congressional appropriations for fiscal support of Alaska's schools.

In "Alaska: Past and Present," Alaska historian Clarence Hulley calls the town incorporation act the first step "outside the control of the federal agent of education" in the creation of a school system in the Alaska territory (Hulley, 1958). It was also the first step in institutionalizing the separation of white and Native education in Alaska towns (Henderson, 1935). Prior to 1900 the Bureau had established both white and Native schools in the unincorporated towns which had large Native populations. Thus, the Bureau's Sitka School No. 1 was for white children, while its Sitka School No. 2 was for Native children. The same two-school arrangement obtained also at Juneau, at Douglas, and at Skagway. But in establishing two schools in these communities, the Bureau was interpreting Section 134 of the 1884 organic

act to mean separate schools, not integrated schools. This interpretation had never been tested in the courts, nor had it been clarified in legislation.

The 1900 town incorporation act relieved the Bureau of Education of the "necessity of expending any portion of its limited funds for the white children in these places," i.e., the incorporated white towns (Henderson, 1935). Congressional appropriations for education in the Alaska territory had shown minimal growth, remaining at $30,000 each year since 1893-94 (Comm. Educ., 1894). By contrast, the license monies transferred to the newly incorporated towns, for the education of the white children in those towns, exceeded the sums expended by the federal government for the entire district outside the incorporated towns. Thus, the effect of the town incorporation act was that the education of white children in the towns was well funded, while the education of Native children in rural areas, was underfunded (Gov. Ak., 1905).

This situation should have been remedied by a 1901 amendment to the town incorporation act which allowed for license monies collected outside incorporated towns to be expended, at the discretion of the Secretary of the Interior, outside the towns (U.S. Statutes, 1901). The amendment was intended to replace yearly Congressional appropriations, and ought to have been sufficient for Bureau funding needs, leaving enough for existing rural schools. But a loophole in the language of the amendment allowed for withdrawals by the Secretary for unanticipated expenses before calculating the Bureau's share of the license fees. Predictably, after the unanticipated expenses were deducted, little was left for the Bureau. This was corrected by another amendment in 1903, and the Bureau immediately found itself the recipient of a fourfold increase in its budget, to $103,377 in 1903, and $145,154 in 1904 (Comm. Educ., 1904).

The money was desperately needed, for decades of chronic underfunding had left the rural schools bereft of basic equipment and supplies. Also, a major population explosion in rural areas had followed the Klondike gold rush in 1897-98. Most of the newcomers were white. And many whites brought with them their ideas concerning white cultural, and perhaps even racial, superiority. This led to demands for a separate school system for white children throughout the territory. In fact, even the additional funding was inadequate to meet the educational needs of white, mixed-blood and Native children outside the incorporated towns. Moreover, by 1905 license fees were being collected from only ten towns, for by that date only ten towns had successfully sought incorporation. The burden on the Bureau increased proportionate to the rise in population, but unfortunately, the funding did not.

As did all prior school legislation for Alaska, the town incorporation act and its amendments changing the Bureau's funding explicitly re-

quired that schools be established without regard to race. The Bureau had continued to interpret this provision to mean separate schools for white and Natives. The town incorporation act underscored and reinforced this interpretation, for the increased numbers of whites in the territory's towns, coming from segregated culture in the "lower 48" states, were not inclined to change the traditional arrangement. According to the 1905 report of the Interior department's Special Agent Frank Churchill, "the Natives do not seem very welcome in the incorporated towns and the children of Native parents are not admitted in the town schools" (Churchill, 1906).

There was also dissatisfaction with the general educational program in many of the white communities outside incorporated towns because of the lack of control by citizens in the management of the schools (Henderson, 1935). That dissatisfaction, especially in areas where the white population increased rapidly, prompted Congressmen who visited Alaska in 1904 to propose new legislation to address the issue. Work on the issue resulted in the Nelson Act of 1905, named for Senator Knute Nelson of Minnesota who took a deep interest in the territory (U.S. Statutes, 1905). Passed on January 27, 1905, the act provided for the establishment of school districts outside incorporated towns with provision for local control, viz., elected three-member school boards. Funding of the Nelson schools was provided for by 25 percent of business and liquor license fees collected outside incorporated towns.

The Nelson Act was fundamentally different from all previous school legislation, for it linked educational opportunity directly to race, and as it turned out, to assimilation. The stated purpose of the Nelson Act schools was education "devoted to white children and children of mixed blood who lead a civilized life." Funding and operation of Native schools, both within and outside incorporated towns, was left to the Bureau of Education. No previous school legislation spelled out the segregation of education clearly on a racial basis. Further, the Nelson Act placed the education of white children, both within and outside incorporated towns, under the supervision of the Governor of Alaska as ex-officio supperintendent of schools. Thus, the Nelson Act clarified and legalized the segregation which the Bureau of Education had practiced from the inception of its work in Alaska in 1885, and which had been reinforced by the town incorporation act in 1900 (Henderson, 1935).

Several attempts were made to challenge the racial intent of the Nelson Act regarding schools in places where no other shcools were available. One such attempt occurred during the Senate debate on the act. Senators Nelson and Teller (of Colorado) argued whether the bill was intended to exclude Native children from the schools (Cong. Rec., 1904). Concern over further handicapping Alaska natives manifested

itself during debate in the House also when Representative Cushman inquired into the intent of the Nelson bill (Cong. Rec., 1904). Representative Cushman proposed to amend the Nelson bill, prior to its passage by the House as follows:

> But I have in mind some peculiar conditions which exist in Alaska. I can conceive that in some localities in which a school is hereafter established for white children that there may be a few native children in that locality. There may not be enough natvie children to warrant the establishment of an Indian school for them, and in that event they might grow up in ignorance within sight of a white schoolhouse the door of which was closed to them by law. It seems to me there should be some proviso in this bill which would adequately take care of a situation of that kind. If I had my way in this matter, I would insert in this bill, at the end of section 7, the following proviso:
>
> Provided, that Indian and Eskimo or native children living in the vicinity of schools established under and by virtue of this act shall also be admitted to the schools for white children in those localities where no school for Indian, Eskimo, or native children is convenient of access.
>
> However, I am anxious to secure the passage of this bill, and at this late hour in the day I do not wish to invite the extended discussion which this proposition might lead to. If experience shall prove the wisdom of my suggestion, this bill can be thus amended in the future.

Many natives and mixed blood children could have benefitted from an amendment such as the one suggested by Representative Cushman, for in succeeding years race prejudice virtually kept them out of Nelson Act schools.

Though the Nelson Act was welcomed in Alaska, concerns about its impact were echoed in Alaska by Governor Brady and others, "I think this law will raise some difficulties in its interpretation but we will do the best we can to put it into execution and find out what amendments may be necessary to make it workable" (Gen. Corr., 1905). The Nelson Act laid the legislative foundation for racial segregation in Alaskan schools, but it was the prevailing attitudes of racial prejudice which played a significant role in institutionalizing that segregation in Alaskan education.

The Nelson Act created concern among those who worked diligently to bring Natives into the mainstream of American life, to ensure the continued self-sufficiency of the Native races. Their fears seemed well founded when, in January, 1906, several children of mixed blood were denied admittance to the Nelson school in sitka, a town which had not incorporated, and which had a large Native population. The denial was upheld when, in January, 1908, Judge Royal A. Gunnison set a major precedent which stood for more than a decade with a decision in a case which grew out of the incident. The case was styled "Davis, et. al., vs Sitka School Board," and in his decision Gunnison interpreted a clause in Section 7 of the Nelson Act very narrowly. It was the clause which included the phrase "children of mixed blood who lead a civilized life" (Ak. Reps., 1922). His interpretation had the effect of further institutionalizing segregation in the school system.

Sitka was the temporary capital in the Alaska district from the time of the first organic act, in 1884, until 1906 when the last officials moved to the new capital at Juneau. There had been substantial white population in Sitka from before Alaska was purchased by Russia in 1867. But, as with most other established towns, the white population had grown rapidly in the last decade of the nineteenth century. The prejudice which prevailed in most of the Alaska territory also existed at Sitka, much to the dismay of those who dedicated their lives to raising the condition of natives through Christianizing and educating them for assimilation into the dominant white culture. By 1906 most Alaskans practiced not a paternalistic, protectionist behavior toward the Native population, but, rather, a racist one. Implementing the standards they had learned in a segregationist period of their culture's history, whites did not want their children unduly influenced by the "less civilized" Native cultures. Indeed, the fact that many Natives, particularly in southeast Alaska, were already well assimilated, did not prevent significant racist behavior by the whites.

Sitka had not incorporated by 1905 when the Nelson Act was passed, and the town took immediate advantage of the new school legislation, applying in early 1905 to the U.S. District Court clerk for status as a school district. On April 15, 1905, local citizens elected William A. Kelly, director, W.P. Miles, treasurer, and Mrs. George Stowall, clerk, of the Sitka School Board (Gen. Corr., 1905). Until that time the U.S. Bureau of Education had operated two schools in Sitka. Sitka No. 1, the white school, had been established in 1885, while the Native school, Sitka No. 2, was established in 1889. Now, in 1905, the Sitka School Board took over Sitka No. 1, while Sitka No. 2 continued to be operated by the Bureau of Education. Both schools opened for the school year in October, 1905. However, inadequate funding for the Bureau's operations forced the Native school's closure just three months later, in January, 1906. But premature closure of the school precipitated a crisis which resulted in a clarification of the segregation

policy that had negative consequences for Natives.

It is likely that had both schools still been under Bureau jurisdiction, both likely would have been closed. But now the white school, independently funded from Nelson Act monies (collected from the sale of business and liquor licenses outside incorporated towns), continued to function.

Shortly after closure of the Native school, Sitka No.2, several children of mixed blood who lived in the town applied for admission to the Nelson Act school. They were "denied the right to attend the school ... while living in the Indian ranche (village)" (Alaskan, 1906).

The school board made its decision to deny admission to the mixed blood applicants while the board's director, William A. Kelly, was absent from the town. Kelly was a long-time professor at the private (Presbyterian) Native school in Sitka, the Sitka Industrial School. He was also superintendent of Bureau of Education schools for southeast Alaska. He had devoted his career to uplift of Alaska Natives and he believed "civilized" Natives were entitled to attend the white school, both in principle, and because they satisfied the provisions of the law. He resigned when he learned of the board's action.

The children who were denied admission to Sitka No. 1 were the grandchildren of a graduate of Sitka industrial School, Rudolph Walton, a Native. Walton was a merchant in Sitka who owned a store, repaired timepieces, paid a man to work off his road taxes for him, and was considered a "civilized" man by the standards of the time. He sent Governor Brady a letter advising him of the events, and requesting "to be informed by what authority the School Board denies them (the children) this privilege." (Gen. Corr., 1905). Brady wrote to the school board asking their reasons for the denial. The board responded by informing Brady that their actions were "based on our interpretation of Sec. 7 of the Act of January 27, 1905, and the same has been sustanied by the U.S. Attorney of this division of the U.S. District court ... But in any case it would not alter the fact of the Board being the judge of who shall attend school." "The Alaskan," a Sitka newspaper, also denounced the board's action:

> In accordance with this decision the clerk of the board has written a note to the merchant whose children had been denied the right to attend the school, informing him that his children could not attend the school while living in the Indian ranche. This man owns one of the cottages in the Cottage Settlement, the inference then is drawn that if he removes his family to that cottage the children well be suficiently civilized to attend the school ... but by going on a little farther he crosses the dead line which robs him of his civilization. Now what

can one think of the narrowness, bigotry and prejudice causing such reasoning ...?

Here the matter stands and a great principle will be violated and a class of people will be robbed of their rights until someone shall take up their cause and fight it out for them.

While we have so far considered this question in a narrow way as touching a few children in this particular locality, it does not end here. The question involves a great principle concerning many people located in various communities... It was the purpose of those who framed our school laws to provide for the education of both white and mixed bloods. (Alaskan, 1906).

The outrage seems to have been limited to a few people in Sitka, however, because the Skagway and Valdez papers carried the following article on the issue:

BRADYITES FOR MIXED SCHOOLS

The word comes from Sitka that W.A. Kelly, one of "Shellgame" Jackson's deputies with the consent of Governor Brady had been trying to force the white school at that place to take in Indian children. The school is maintained by license money collected from the merchants. The school board refuses to permit the game attempted by Brady and Kelly and appealed to District Attorney Boyce, who has sustained them in their course. The government's lawyer says the school boards of the white schools have a right to refuse Indian children should they see fit to do so. (Daily Alaskan, 1906)

No further public attention was given the issue, even in the Sitka "Alaska." Brady's efforts were stymied, also, because the U.S. President accepted Brady's resignation before matters were resolved. Brady's replacement, W.B. Hoggatt, did not share Brady's concern over the welfare of the Native and mixed blood children.

The re-opening of the Bureau school, Sitka No. 2, the following school term, also probably helped assuage the feelings of those who were concerned that Native children would not have the opportunity to attend school.

But Kelly was not satisfied that the children could again go to the native school. He pursued his concern over the situation by filing a lawsuit in the territorial court at Juneau, on behalf of the Davis children and four other children who were likewise denied admission to the Nelson school in sitka, in an attempt to have the children declared "civilized" and the school board ordered to admit them to the Nelson school.

Two years later, in January, 1908, Judge Gunnison of the First Judicial District for the District of Alaska rendered a decision in the matter. He determined that in order to properly consider the plaintiff's claims that they lived a civilized life, a test could be devised:

> That those of mixed blood who reside with the tribe or among the natives where the tribal relation has been broken down have, as a general rule, been regarded as Indians ... A necessary deduction to be drawn from this is that the mixed blood is presumed to partake of the character of the tribe with which he lives, whether it be civilized or otherwise. Congress ... must be presumed to have had in mind the above rule, and that fact, upon which it is based, that where mixed bloods live among and associate with the uncivilized, they become subject to and influenced by their environment as naturally as water seeks its level.
>
> In the case at bar I am of the opinion that the test to be applied should be as to whether or not the persons in question have turned aside from old associations, former habits of life, and easier modes of existence; in other words, have exchanged the old barbaric, uncivilized environment for one changed, new, and so different as to indicate an advanced and improved condition of mind, which desires and reaches out for something altogether distinct from and unlike the old life.

In considering the cases before him, Judge Gunnison concluded that in no instance did the six minor children, of four different families, meet the requisites of his test. "Civilization, though, of course, the term must be considered relative, includes, I apprehend, more than a prosperous business, a trade, a house, white man's clothes, and membership in a church." The Judge's decision can only be based upon evidence in the record. And it appears that Walton's family life was not placed in the record. In the conclusion, Judge Gunnison stressed that "Walton himself is far in advance of the others. What his family life may be is not disclosed."

The effect of Judge Gunnison's decision in Davis on the opportunities available to native and mixed blood children in the Alaska territory is difficult to pinpoint. The standard which mixed bloods had to meet to be considered civilized meant that few mixed blood children would be admitted to Nelson schools.

As many as ten years after Davis, Solicitor of the Interior Department, Charles Mahaffey, in a decision rendered in December 1919, stated that the number of mixed bloods who could meet the Davis test, and therefore be admitted to the school, would be negligible (Wrangell Sentinel, 1921).

But the records of enrollment in Nelson Act schools in 1921-22 indicate that, in fact, native and mixed blood children were not having difficulty enrolling in the shcools just over a decade after the Davis case (Henderson, 1935). Lester Henderson, analyzing the history of schools in Alaska in 1935, asserted that the Nelson Act injected a highly controversial question in specifying a racial basis for attendance in the schools, but that, "fortunately, the question of whether or not individual children of mixed blood lead civilized life (was) seldom raised." Most towns with high schools, he wrote, accepted both whites and mixed blood children if they came from a sanitary home.

Though the effects of the Nelson Act and the Davis decision are difficult to assess with respect to their immediate effects on children, clearly many suffered as a result of both. With denial of admission of well assimilated students to "white" schools, and the resulting consignment of those students to Native schools where there was less funding, and sometimes the schools were closed or non-existent, certainly opportunity for education was more limited than it might have been otherwise, and resentment over discriminatory treatment of "civilized" Natives was encouraged.

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Toward Expressive Competence: Visual Imagery Enhancement in Mildly Handicapped Six Year Olds

Carolynn Haycox

Six-year-old mildly handicapped children spent 30 minutes daily for one academic year in guided imagery tasks planned for the enhancement of expressive language skills. Some of the children were slow learners, others had learning disabilities and/or communication disorders. They were enrolled in a public school classroom for children at risk for academic failure in first grade.

Subjects were directed to produce inner visualizations from situations verbally elicited by their teacher. Subjects told stories, drew pictures, and wrote books. Pretest and posttest scores on several standardized measures of vocabulary and language were compared. Expectations for a high-risk population would have predicted a decrement in scores; subjects instead demonstrated statistically significant gains in posttest measures.

The children sit expectantly, hands folded.

"Close your eyes and make a picture in your mind," says the teacher. "It's your birthday. Pick yourself up and put yourself at your table. It's time for your cake. Have your Dad bring it in. Have him put it down in front of you. Have it be your favorite kind. Put six candles on it. Give it the most wonderful decorations you can dream up . . . Do you see them? Now have a friend beside you. Have another friend. Make all the chairs full of friends. It's time for your wish. Get the picture of your wish ready in your mind . . . Ready? Okay, blow!

"And the Question of the Day is, 'What did you wish for, and why?' If you want to answer, come on up front."

Most of the children scramble to the front of the room, where they make a semi-orderly line. Each volunteer has a chance to answer. Joey is first. He hesitates, frowns, and looks to the teacher for help. (It is late September, and though these children have played this "game" a half dozen times, they need a lot of encouragement).

Thanks are extended to Drs. Marilyn Johnson and Marilyn Buckley of the School of Education for their assistance.

"Joey, tell us what you wished for, and why," reminds the teacher. His memory clicks, and Joey's face lights up. He'd lost his thought in the scramble to get up to the front of the room first, and now he has it back. "I wished for a Big-footer," he says, naming the latest popular product of the television cartoon programs.

"Tell us why," prompts the teacher.

"Cause, ... um ..." Joey looks around, eyes scanning for a rescue. None is forthcoming. He shrugs and speeds back to his seat. Seven volunteers follow, each naming a toy, many echoing Joey's response. There is little verbal embroidery here, not a bit of causal embellishment. These youngsters are not comfortable as yet with the "formal" demands of classroom recitation. No matter. They have eight months left. And by May, the class will fill a 30-minute audio tape with their daily verbalizations.

The how and why of moving a class of young handicapped children from hesitant and dysfluent speaking to facility and comfort with verbal language is the subject of this paper. In a brief recap of a year of classroom-based research, we will explore the following:

a. the nature of this young, mildly handicapped population;

b. the genisis and description of the intervention called "Question of the Day";

c. the rather startling gains these youngsters made in measures of expressive and receptive language fluency; and,

d. some implications for curriculum delivery in the primary grades.

The class was a group of fifteen six-year old children, identified by the Anchorage School District criteria as high-risk for severe academic difficulty in first grade, after an unsuccesful Kindergarten year. "I'll have some children for you this fall," the Kindergarten teacher had said. "These little ones will never make it in first grade. Amy can never find her pencil, and every time we do a task we all sit and wait while she hunts for it. When she does find it, her letters are unreadable. I give her directions three times, and she still doesn't know what to do. And her mother doesn't seem to notice that anything is wrong.

"Billy can't sit still, even for a few seconds. Instead of listening, he's kicking his neighbor or diving under the table after his scissors, which he drops every minute. He has yet to finish a task in time to come to 'story' with the rest of the class.

"And Davey - he really puzzles me. He tries and tries, but he can't answer a question. He has the idea; I can see it in his face. But the words will not come out. Yet he talks in the hall just fine."

There were others. Sammy had great difficulty paying attention for even a few seconds, instead focusing on the movement of an insect, or a noise in the next room. Robbie showed a perfectly normal set of behaviors for a four-year old. The problem was, he was nearly seven.

The population, then, was a classroom of such children: mildly handicapped learners, troubled in school, who looked normal to family,

friends, and neighbors - but not to their very first teacher.

It must be emphasized that, though these children exhibited many of the characteristics of the learning disabled and/or the language disordered, they had been neither diagnosed, nor labelled as a particular exceptionality. Indeed, many of the characteristics which caused their teachers so much concern were exhibited by all children at some time or to some degree: difficulty following directions, confusion, behavioral disturbances, immaturity, and especially, expressive language problems. The population of high-risk learners, however, possessed these characteristics to an exaggerated degree, sufficiently so to cause them problems within a standard classroom setting.

The children were enrolled in a compensatory program called "Junior First" in many districts. In Anchorage it is call "Modified Primary." Modified Primary provides a diagnostic-perspective "bridge" year between Kindergarten and first grade, the purpose of which is to circumvent the failure syndrome by providing a year in which learners may acquire and practice basic skills while having a chance to mature. The emphasis is on remedial teaching strategies and continuous monitoring of each child's deficits, strengths, and levels of mastery of academic content.

Current compensatory educational practices - those strategies designed to address difficulties in language and social experiences - usually include a language-experience component. In the language-experience approach, children share an event such as a cooking project or a field trip. Children then talk about their experience, while teachers write down their words for use in reading, writing, and/or spelling exercises. The rationale is multifaceted: hands-on experiences provide learners with an impetus for talking; their interest and involvement spurs richer language; children can more easily develop reading and writing ability through their own "organic language" than through the words of basal programs, which may or may not be in their vocabularies.

Language-experience approaches are efective with fairly small groups, or where several adults are at hand to help. But there are no aides in Modified Primary, and parent volunteers are rare. The challenge of arranging a pancake fry with fifteen distractible yougsters requires more courage than most teachers possess.

In the interest of reasonableness, then, it was necessary to devise a compensatory strategy which could be as effective as a language-experience approach, but without the pancake batter being poured on the floor. The goal was a practice in which the teacher could keep physical movement to a minimum while engaging the youngsters in enjoyable practice in basic expressive skills. The result, as practiced during the 1983-84 school year, was the "Question of the Day" intervention.

The strategy utilized experiences which most children were likely to have had or would be able to imagine, and turned these experiences in-

to"imagined" language experience lessons. Each day's topic - the Question - was different; the daily format was the same. The children were invited to visualize: "Close your eyes and make a picture in your mind." The topic or setting was then unfolded, in the manner of a folk storyteller, while the children were invited to make inner visual representaitons, and to describe these images to the class. Sharing was strictly voluntary, with the teacher encouraging but never coercing the few reluctant participants. Most children volunteered daily; a few were selective, and two rarely chose to go before the class, though they would answer while at their seats.

After all volunteers had responded, the teacher would begin a drawing on the chalkboard, eliciting elements from the class. For example, for a Question concerning washing the car, the exchange proceeded as follows:

Teacher: "We need a dirty car. Tell me how to begin ..."
Child: "It gots wheels."
Teacher: "It has wheels? Okay, where?"
Child: "Down there, by the bottom."
Teacher: "Okay, what next?"
Child: "It needs a roof, and a bumper and doors."
Teacher: "Good; there they are. (Continuing to draw) Now what?"
Child: "That car don't got no thing."

Circumlocutions - "that thing that" phrases - abound in the high-risk population, a manifestation of vocabulary deficiency. This child did not have the word "license" in his personal lexicon. Though she knew what the child meant, the teacher "played dumb" while correcting grammar:

Teacher: "The car doesn't have a - thing? I guess I'm confused. Tell me more."
Child: "You know, the things that gots numbers on it."
Teacher: "Oh, the thing that has NUMBERS on it. Let's see ... We call that a ..."

Hands waved wildly, and the term was supplied by a classmate. (The listener is asked to remember this little exchange; the daily spontaneous occurrences like this one produced some remarkable vocabulary scores at the end of the year.)

While the cartoon remained on the chalk board, the class received drawing paper. Seven or eight minutes was allotted for each child to draw a picture of his-her own idea in response to the Question. The chalkboard image was left in place to assist those who were unsure of their drawing capability, and the class was told, "I'll leave the drawing there, but you probably have a much better idea that you will draw."

When the brief drawing time was over, volunteers again lined up in front of the room to "tell a story about" their pictures, providing another chance for verbal practice. The children had been encouraged to talk with their tablemates during the drawing phase, and there was much sharing of both ideas and language during this time. Many of the verbalizations were considerable enriched during this assimilation time.

Throughout the year, verbal samples were gathered daily from each volunteer and were stored along with their drawings. At the beginning, verbalizations were hand-recorded. By mid-year, however, the stories were becoming so lengthy that it was impossible to keep up (shorthand not being a prerequisite for elementary certification). A tape recorder was therefore introduced, and after some initial hesitation, the children enjoyed taping their stories.

It was anticipated that the children's ability to plan, organize, and articulate a unique story would grow throughout the year, and informal measures were designed to assess the development of this skill. Each child's verbalization, in its entirety, to one day's Question was defined as an "utterance." Samples of utterances were drawn from those gathered in late September and again in May for each student. The number of words per utterance was counted and averaged to determine fall and spring Mean Length of Utterance scores for each student. Measures of class Mean Length of Utterance were determined as well.

Class Mean Length of Utterance scores increased from six words to thirty-two words per story through the year, a more than five-fold increase. Applying a slightly different standard, a measure of verbal complexity was generated. The Mean number of Thought-Units per Utterance was determined by counting the number of verb-subject links per story. Classwide mean scores for Thought-Unit complexity rose from one Thought-Unit to 4.5 Thought-Units during the study year. Both measures were significantly greater than chance expectations.

However, one would expect children who are exposed to thirty or more minutes of intervention daily to make gains such as these on informal measures of expressive fluency. It could be considered risky to devote such a large portion of insturctional time to such an intervention without "harder" data.

For this reason, it was decided to investigate the data from standardized measures. Modified Primary classes were measured in October and again in late April on the Iowa Tests of Basic Skills, which assess listening, vocabulary, prereading and language skills. The students were also measured on the Boehm Test of Basic Concepts, which assesses a child's understanding of quantitative concepts such as a "few," "several," "equal," and "third;" of prepositional terms such as "above," "in," and "behind;" and of temporal terms such as "after," and "beginning," among others. The Boehm is largely a measure of receptive vocabulary.

It was the gains these students demonstrated on the standardized measures of vocabulary and language which were the more exciting findings. First, one must realize what constitutes "progress" for the average learner on a standardized measure of academic achievement such as the ITBS. The "average" learner will score at or near the 50th percentile on a standard measure, and will not move up or down on the percentile scale by more than a few points from one test to the next if he or she is making "expected" progress. However, the high-risk learner is not generally expected to keep up with peers (at least not without intervention); therefore, "expected normal" progress for the mildly handicapped learner would predict a slight decrement in scores from one testing period to the next. To maintain a previous percentile ranking is therefore significant progress for the handicapped learner. Given the expectation of slight decrement in percentile ranking, then, the outcome of the gains these students made is quite remarkable.

On the ITBS language section, the class mean score increased from the 25th percentile (lowest quartile) to the 34th percentile. On the ITBS vocabulry section, the class mean score increased form the 35th percentile to the 51st. Gains of nine and sixteen percentile points, respectively, may not appear particularly exciting. However, let us consider the measures. Modified Primary children are neither Kindergarteners, nor are they first graders. But there is no "bridge year" level on the ITBS test. Students are pre-tested in the fall at the Kindergarten level (which they have just completed, albeit unsuccessfully), and are post-tested in April, at the first grade level (despite not yet being in first grade). The essence is that the children scored in the lowest third among children nationally on an easier pre-test, and at or near the nationwide mean on the more difficult, higher level post-test.

On the Boehm Test of Basic Concepts, gains were still more remarkable. From a fall pre-test class mean of the 34th percentile, scores rose to a post-test mean of the 77th percentile, with a number of students earning perfect scores on the fifty-item test. Boehm vocabulary had not been taught as a discrete subject during the study year, but had merely been incorportated into the "Question of the Day" intervention as the need arose.

A phenomenon which went unmeasured, but which was perhaps the most important finding of all, was the development of a sense of self-as-competent-learner which these children exhibited, particularly toward the close of the study year.

During the latter part of the study year, some of the children began labeling their pictures with words and phrases, using "invented spelling" generated from what the children knew of the sounds of letters. Soon, a writing center was set up in the room, with baskets containing word and phrase cards, pencils and blank books. Many of the children produced a story book a day for the last six weeks or so of the school year.

These children considered themselves authors and storytellers, and their books were given as gifts, traded, and donated to the school library, as well as being read to the class. For children not yet in first grade, these learners were capable and confident in their developing literacy.

This educator would make a quiet plea to teachers and parents of children growing up surrounded by video media: teach them to imagine. Visual imagery is a powerful tool in the storage and retrieval of information from memory. This fact alone is sufficient reason for the inclusion of imagery strategies across the curriculum. Many children imagine well without emphasis from nurturing adults, but many do not. For those for whom imagery is an unexplored phenomenon, its introduction may well lead to enhanced ability, as this study suggests. In the words of G.K. Lovgren, an art educator, "... inner sight is the most primary and valid of our gifts, participating in all that we do, in all the skills and knowledge that we acquire ... the awakened and well-functioning inner sight becomes a silent, self-defending faculty."

We began this visit in September, when Joey, telling of his birthday wish, spoke a five-word utterance: "I wished for a Big-footer," and was unable to articulate a reason.

Let us now move forward in the school year to May.

The children sit expectantly, hands folded.

"Close your eyes and make a picture in your mind," says the teacher. "You have been taking a nap on the sofa. You hear a little bump and you wake up and look out the window. Your house has moved! It isn't in your neighborhood any more. In fact, your house is way out in the desert, and it's miles and miles to the nearest town or neighbor. There's no one to play with and no television. So, you have to 'invent' a friend. Get a picture of our invented freind ready in your mind... What will you and your freind do to have fun? If you are ready to tell us all about you and your invented friend, come on up."

Most of the children scramble to the front of the room, where they make a semi-orderly line. Joey is first. He needs no encouragement.

"Me and my friend was playing freeze tag, and he says, 'Stop! I've got an idea. We can write something to our grandmas.

"Oh, no, we don't know the address to our grandmas. I have a green shirt and here's my friend, Superhero, and here's my house and here's the cherry tree and my Dad told us, 'Don't go by it.'"

There are sixty-two words in Joey's May story. He expresses considerably more imagination and sophistication in this later story than he appeared to have had at his command the previous September. What is more, he does not hesitate, or falter, but tells his story in a planned and fluent manner. He has developed sufficient poise to take his audience into account, and to enjoy his experience. Joey's story is entirely typical. Joey and his classmates will enter first grade considerably

better prepared for the demands of the mainstream classroom. The picture in his mind is one of himself as an imaginative and successful learner.

TABLE 1

Posttreatment Gains on Informal Measures of Expressive Competence

Concept	Measure	Mean Gain	t	p
Verbal Fluency	MLU	25.6 words	8.75	<.001
Verbal Complexity	MTU/U	3.5 thought-units	21.56	<.001
Vocabulary	TOWL	5.6 points	4.41	<.001
Pictorial Fluency	number of details	9.1 details	5.35	<.001

df = 13

TABLE 2

Posttest Perfomance on Standardized Measures

Measure	Mean Gain, Percentile Rank	Mean Gain, NCE units	t	p
ITBS Vocabulary	14	17	2.4	<.05
ITBS Language	9	11	3.1	<.05
Boehm	43	40	4.48	<.001

df - 14, ITBS df - 10, Boehm

TABLE 3

Performances on Standardized Measures of Vocabulary, Language, and Basic Concepts for All Groups

Measure	Mean Difference in Correct Number of Responses, IG Over Comparisons	t	df	p
Boehm				
IG-CG1	8 of 50	2.29	25	<.05
IG-CG2	2 of 50	.714	30	> .10
ITBS Vocabulary				
IG-CG1	5 of 29	17.73	30	< .001
IG-CG2	3 of 29	4.51	30	< .001
ITBS Language				
IG-CG1	3 of 27	7.23	30	< .001
IG-CG2	-1 of 27	—	—	—

IG = Intervention Group (the class studied)
CG1, CG2 = Control Groups (Modified Primary classes not exposed to Question-of-the-Day Strategy.)

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The Effects of Paralysis on Development of the Neuromuscular Junction

Jesse Owens

During the development of the vertebrate embryo many events must occur in a predictable and orderly fashion to give rise to a normal animal. Of special importance is the development of a properly functioning nervous system. In the South African clawed frog, Xenopus laevis, motor neurons arise from the spinal cord and establish communication with the myotomal muscles (muscles which are destined to move the tadpole's tail) about one day after fertilization. The development of this connection can be effectively studied in the embryo. The functional contact between motor neuron and muscle is a type of synapse called the neuromuscular junction. For the nerve to instruct the muscle to contract and cause movement, a complex interaction between the neuron's terminal and the muscle cell must occur. This interaction results in structural and functional specializations in both the nerve terminal and the muscle membrane directly beneath the nerve terminal. This indicates that developmental changes at the neuromuscular junction are under very precise control. We have monitored these events using electrophysiological methods and have carefully mapped them throughout development. In addition, we have raised embryos in a potent paralytic neurotoxin, tetrodotoxin, and examined the development of the neuromuscular junction in the complete absence of nerve impulses and muscle contraction. We found that the neuromuscular junction in Xenopus myotomal muscle develops to maturity on the same schedule as non-paralyzed tadpoles. This is the first study of the effects of paralysis on the developing neuromuscular junction which has given unequivocal results.

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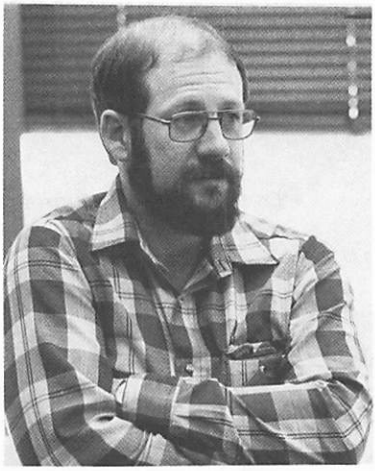
Introduction



Jesse Owens listens at a session

Embryonic development begins with the division of a single fertilized egg into two cells which subsequently divide into all of the cells which comprise the animal. If a normally functioning organism is to be produced by this process, the choreography of developmental events must be tightly controlled.

The construction of an animal is self directed. That is, all of the blueprints, including those for the building tools, are contained within the genetic material of each cell. However, as in the building of any structure which begins with a single building block then progressively becomes more complex, an overriding concern becomes the coordination of construction activities. In a developing animal containing thousands, perhaps millions of individual cells, it is vital that each cell differentiates into its specialized form not only in the right location in the animal's body but also at the proper rate and proportion to those cells with which it must interact.

When cells of multicellular animals become highly specialized, each cell type channels most of its resources and efforts into accomplishing one or a few tasks. This results in interdependence with other specialized cell types. Since the survival of the animal depends on the cooperative effort of many specialized cell types or tissues, one of the most challenging aspects of animal construction is the development of a properly functioning communication system between disparate structural and functional components.

This communication system functions on at least three levels. Cells with different functions may influence each other through physical contact. Soluble substances such as hormones may be secreted by gland cells and disseminated to all other cells via the bodily fluids. In this case only those cells which are receptive to the hormone respond by initiating an intrinsically coded program of metabolic behavior. This is a relatively slow method of communication and is primarily utilized to "set policy" for long term development, growth, food processing and storage, and other activities in which response time is not the most critical consideration.

However, if an animal is to survive, the rapidity and appropriateness of its response to danger, food stimuli, or internal changes such as a fall in blood pressure, is often the critical factor. Clearly, if an out-of-control baseball is rapidly approaching one's face it would be ineffective to depend on the rather slow process of hormonal activation of the cells involved in moving out of harm's way. As a result, nature has evolved a third method of communication, this being a nervous system which allows for very rapid and precise communication between those parts of the body which receive and process information on a moment to moment basis and those parts which are capable of responding to this information. The latter are glands and muscle cells.

In order for this communication system to be established, certain nerve cells, or motor neurons, which are based in the spinal cord or brain, or central nervous system (CNS), must send fine filamentous extensions called axons from the central nervous system out to the periphery to make connections with the target glands or muscles.

If the wiring of the nervous system is to be correctly completed, each of the many neuronal projections must find the proper path to its specific target and ignore and bypass muscles and glands which are rightfully to be innervated by other neurons. Furthermore, and of great importance, a communication interface must be built between the neuron's terminal and its specific target. Simply coming into close contact with the target is not sufficient to allow the neuron to transmit messages from the CNS to the target, any more than lying the output wires from the stereo amplifier on the speakers will cause a response.

As in all cases of communication between components, some type of specialized mechanism must be utilized to transmit the message from one component to the next. In the rather simple example of the stereo speakers this consists of the speaker jack, and in the case of the neurons and their targets this is called a synapse.

The synapse like any other complex apparatus is built following a specific plan which ultimately results in a junction with distinctive molecular constituents. (Anderson & Cohen, 1977; Kullberg, Mickleberg, & Cohen, 1980; Dennis, 1980; Bennet, 1983.) The cell membrane of the neuron's terminal and the region of cell membrane on the target cell directly opposed to the neuron's terminal undergo many structural and functional changes. These specializations all serve to insure that the message from the neuron transverses the gap between neuron and target in such a manner that an appropriate response to the neuron's signal is elicited from the target cell.

There are many types of synapses found throughout the nervous system. The development of many of these is difficult to study because they are buried within the brain or spinal cord. However, the synapse between the motor neurons, which carry movement messages from the CNS, and the skeletal muscle which they instruct are relatively easy to

monitor and observe during their development. This particular synapse between motor neuron and skeletal muscle is called the neuromuscular junction.

There are several reasons why development of function in the neuromuscular junction holds a significance for study.

1. Neuromuscular junctions are found on the surface of muscle fibers and are therefore relatively accessible to electrodes or other instruments utilized to study their function.

2. A detailed understanding of how this type of synapse functions and develops may yield insight into major governing principles of synapse function and development.

These principles may be applicable to other less easily studied synapses such as those in the embryonic CNS or those which must form anew during recovery from an injury to the nervous system.

3. Of no less importance is the hope that by understanding the way normal function develops in the neuromuscular junction it may be possible to identify and perhaps alleviate the symptoms which result from failure or malfunction of neuromuscular transmission, as in the case of the muscle weakness disease, myasthenia gravis. It is also known that a number of deadly poisons such as botulinum toxin, curare, black widow spider venom, "nerve gases," and some snake toxins produce their deadly effects by interfering with the function of the neuromuscular junction. Understanding their specific mode of action can yield useful information about the mechanics of neuromuscular transmission and perhaps lead to new remedies for intoxicated humans or other animals.

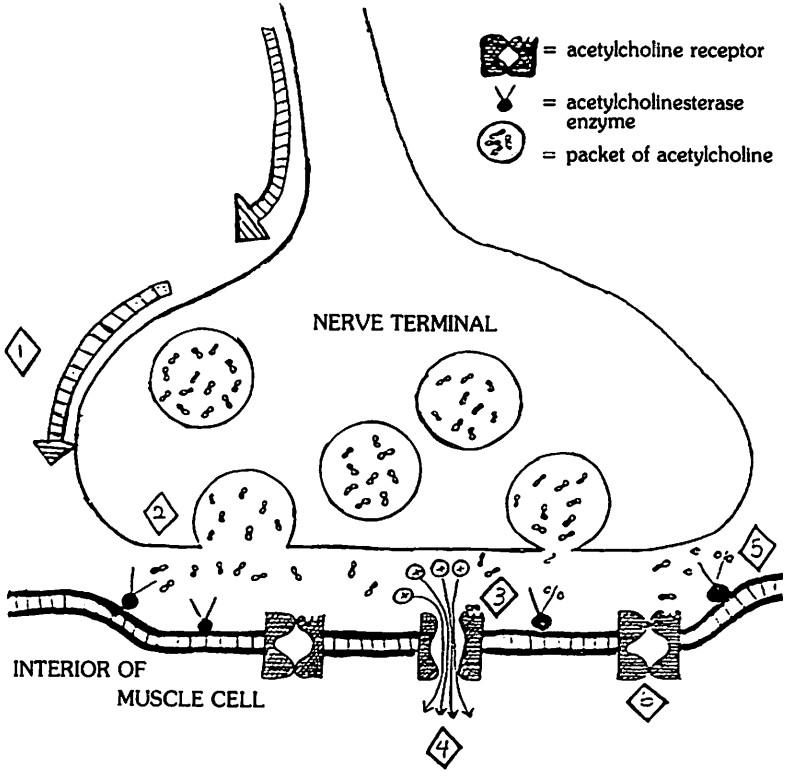
Unlike the simple speaker jack for which there is no change in the form of the message as it passes from one element to the next, the working components of the neuromuscular junction do not serve as a simple conduit for direct transmission of the nerve's message, but instead translate and process that message into a form which can trigger muscle contraction, provided the translated message is sufficiently intense. It therefore follows that changes in the neuromuscular junction will ultimately determine to what degree the muscle pays heed to the nerve's excitatory message.

The transmission of a message across the neuromuscular junction begins with the arrival of the nerve's impulse by way of its axon (Figure 1). In the tip of the axon are many very small membrane bound sacs, or vesicles, filled with the neurotransmitter substance, acetylcholine. The nerve impulse invades the tip of the axon and causes the membrane of some of the vesicles to fuse with the membrane forming the axons tip (presynaptic membrane).

As a result the acetylcholine from the vesicles is spilled out of the neurons terminal and into a narrow gap between the nerve and muscle.

FIGURE 1

Diagramatic representation of important functional components of the fully developed neuromuscular junction. Numbered are major events occurring in neuromuscular transmission.



1. Arrival of nerve impulse
2. Release of acetylcholine from nerve terminal
3. Acetycholine binds to receptor... channel opens
4. Positive ions flow inward causing voltage
5. Acetylcholinesterase rapidly destroys acetylcholine upon contact
6. Acetylcholine released from receptor... ion channel closes

Once the neurotransmitter molecules arrive in this space between the nerve terminal and the post synaptic muscle cell membrane there are three possible fates for each molecule of acetylcholine: 1) diffuse away; 2) bind to acetylcholine receptor; 3)be destroyed before or after binding to receptor.

A given molecule of acetylcholine may simply escape by diffusing away from the synaptic cleft, and cause no response at all in the muscle cell. But if the muscle is to become aware of the nerve's message, the transmitter molecules must interact with components of the post synaptic membrane.

Directly underneath the presynaptic membrane lies the highly organized machinery of the post synaptic membrane which translates the chemical message into initiation of muscle contraction. Chief among those are densely packed, large protein molecules whose overall shape is somewhat unstable. When molecules of acetylcholine bind to a special part of these proteins it causes a shift in their structure. These acetylcholine receptor proteins extend all the way through the muscle membrane and when acetylcholine binds, a pore or channel through their middle forms.

The muscle cell expends a great deal of energy to set up an electrical battery across its membrane with more positive charges on the outside than inside. If there are no holes in the fatty cell membrane then it serves as a good insulator and effectively stops positive ions from crossing back into the cell. However, as with any battery, if a low resistance pathway can be found the positive ions move toward the negatively charged side of the battery, in this case in the interior of the cell.

The channel which forms in the acetylcholine receptor is such a pathway. While it is open, positive ions in the vicinity of the synapse rush through these channels causing a change in the voltage across the muscle cell membrane. If this change in voltage is great enough, it will reach a threshold value which sets in motion a cascade of events leading to muscle contraction.

Obviously, one of the major factors which determines the size of the voltage change due to release of acetylcholine from the neuron is the number of positive ions which flow into the cell via the acetylcholine receptors. This parameter of synaptic transmission is controlled primarily by the amount of resistance to positive ion movement through the channels, and the amount of time the channel is open allowing the ions to flow.

As will be discussed later these biophysical properties of the acetylcholine receptors are not fixed, and change according to a highly ordered schedule during development. (Kullberg, Owens, and Vickers, 1985; Kullberg and Owens, 1985; Kullberg, Brehm, and Steinbach, 1981).

To provide coordinated and appropriate motion it is necessary that contraction of the individual muscles used in movement be very crisp and occur only in response to the nerve's instruction to move.

The removal of the nerve's instruction to contract through diffusion of acetylcholine from the synaptic cleft is not rapid enough to insure this crispness of contraction. Instead, each acetylcholine molecule might repeatedly bind to and be released by acetylcholine receptors before it finally escapes the synaptic cleft. This would result in an activation of the receptors much like an echo reverberating the instructions to contract well beyond the point at which the nerve becomes silent.

To correct this problem, special catalytic proteins are stationed between the pre- and postsynaptic membranes which rapidly destroy the neurotransmitter molecules upon contact. These acetylcholinesterase enzymes are so effective that most acetylcholine molecules which bind to a receptor are destroyed before they ever have the opportunity to bind to a second receptor (Katz and Miledi, 1975). The responsibility of acetylcholinesterase is to terminate the activity of the transmitter substance so the muscle can relax when the nerve is not instructing it to contract. This component of the neuromuscular junction is the target of several deadly "nerve gases" and insecticides which inactivate the enzyme and prevent acetylcholine from being destroyed. This results in uncontrolled muscle convulsions, paralysis, and often in death.

This complex junction between nerve and muscle which must restate the nerve's message with accuracy and sensitivity does not come ready formed, but instead must be fashioned in accordance with a very precise set of instructions.

The development of connections between the nervous system and muscle can be effectively studied in the developing amphibian embryo. In the South African clawed frog Xenopus laevis, motor neurons arise from the spinal cord and establish communication with the myotomal muscles (muscles destined to move the tadpole's tail) about one day after fertilization. In about five days the construction of the neuromuscular junction is advanced to such a degree that neuromuscular transmission is similar to that in a mature animal.

Using electrophysiological techniques, I, in collaboration with Richard Kullberg and Julian Vickers, have monitored and carefully mapped the changes in synaptic function during this period of time. In addition, we have raised embryos in a potent, paralytic neurotoxin, tetrodotoxin, which has no effect on synaptic machinery but blocks nerve impulses and some of the events leading to muscle contradiction (Kao, 1966). This has allowed us to determine if total paralysis during the period of neuromuscular junction development affects its schedule of maturation.

Methods

This study was achieved by recording and measuring thousands of miniature end plate currents (mepc's) throughout development. When a nerve impulse invades the terminal many packets of transmitter are released simultaneously resulting in a "command" to contract. However, even when nerve impulses are prevented from occurring the nerve terminal spontaneously releases individual packets of acetylcholine at about one per second. Instead of a "command" they are more like a "whisper"; identical to the "command" in all respects except the size of the voltage change they induce across the postsynaptic membrane. Mepcs are too small to cause the membrane to reach threshold for muscle contraction, which allows us to record synaptic activity without the muscle squirming about.

To record mepcs we place a ground electrode in the slightly salty bath water containing the experimental preparation and a very small recording electrode directly over the synaptic region. When a packet of acetylcholine is released into the synaptic cleft as many as several thousand receptors directly opposite are almost instantaneously activated and open their ion channels. Each time the receptor channels open due to spontaneous release of transmitter, the quantity of positive ions directly under the recording electrode is suddenly reduced as the ions flow into the muscle interior through the receptor channels. This results in a charge difference between the electrode and the ground which is direcly proportional to the amount of current flowing through the acetylcholine receptor channels at any point in time.

If the voltage change in the recording electrode produced by the mepc is amplified and displayed on an oscilloscope screen, a signal with a characteristic checkmark shape is observed (See Figure 2).

While there is an almost simultaneous opening of receptors resulting in a sudden deflection of the recorded signal, the receptors don't close simultaneously. Instead a specific constant fraction of the receptor channels close over each unit of time resulting in a characteristic exponentially declining curve as the recorded voltage diminishes due to channel closing. Some of the receptors close extremely rapidly, less than a thousandth of a second (a millisecond), while others may stay open several times that long. The average amount of time that the population of channels stay open (mean channel open time) is an intrinsic characteristic of the population of acetylcholine receptor channels.

The amount of time required for the recorded signal to decay is a sensitive indication of synaptic function, especially mean channel open time and the contribution of acetylcholinesterase in shortening the time course of transmitter activity (Wathey, Nass and Lester, 1981).

In order to compare recorded signals with each other we assign a decay constant to each signal which represents roughly the amount of time it takes for the signal to diminish to about one third of its peak amplitude.

Results

Spontaneous movement in Xenopus embryos begins about 26 hours after fertilization (stage 24) and about two hours after the motor nerve reaches the myotomal muscle (stage 21). This is a full day prior to hatching, at which time they are active swimmers. In other words, the neuromuscular junction is heavily utilized throughout the period it is being constructed.

It has been demonstrated in other parts of the nervous system, such as the visual system, that in order for certain neural pathways to develop and survive they must be used during critical periods of development (Hubel and Wiesel, 1970). Does nature require activity of the neuromuscular system for the normal schedule of development of the neuromuscular junction to proceed?

In control and TTX paralyzed embryos there was no difference in the schedule of change in mepc decay throughout the period of neuromuscular junction maturation. Mepc's from brand new (stage 24) neruomuscular junctions have the longest decay constant (about six msec), and during the next eight to 10 hours a dramatic reduction in the decay time occurs to about three msec. Over the next four days mepc decay constants are reduced from about three msec to about one msec (Figure 2 and Figure 3).

We believe that the earliest mepcs are so long due to lack of acetylcholinesterase at the newly forming junctions, and that the rapid reduction in mepc time course over the next eight to 10 hours is due to a great increase in the quantity of acetlycholinesterase deposited at the neuromuscular junction.

As a test of this hypothesis we bathed muscles of both groups at various stages of development in menthane sulfonyl flouride (MSF) which binds to and irreversibly inactivates the catalytic activity of acetylcholinesterase. If acetycholinesterase is simply absent we would expect this treatment to cause no change in mepc time course, which is exactly what is observed at stage 24. However, in embroyos eight to 10 hours older (about stage 32), this treatment approximately doubled the mepc decay time. Since similar results were obtained in TTX paralyzed embryos and controls we conclude that paralysis does not interfere with the rate of incorporation acetylcholinesterase at the neuromuscular junction.

Studies using other electrophysiological techniques (Kullberg, Brehm, Steinbach, 1981; Kullberg and Kasprzak, 1985) have shown that two classes of acetycholine receptor channels exist on the muscle membrane. One of those exhibits a mean channel open time of about three msec and the other a little less than one msec.

Through mathematical modeling (Wathey, Nass and Lester, 1979), it has been theorized that if the population of channels giving rise to the mepc consist of only three msec channels then the mepc decay constant will always be three msec or longer, and if the population is exclusively one msec channels the mepc decay constant will be one msec or longer. If a mixture of the two types of channels give rise to a mepc, the signal from the slow (three msec) and the fast (one msec) channels are superimposed. To measure a complex mepc such as this, the two components have to be separated by computer and then measured separately.

Once acetylcholinesterase becomes abundant in embryos at 35 to 40 hours old (about stage 32), the open time of the acetlycholine receptor channels is the major determinant of the mepc decay time. Here we see mepc decays of about three msec, so we conclude that most of the channels are of the three msec variety.

From this point in development a second transition in mepc decay begins. Gradually the mepc time course becomes progressively more rapid. At about the fifth day (stage 46) the mepc decay time stabilizes at about one msec which is similar to mepc decays in the mature animal (Figure 3).

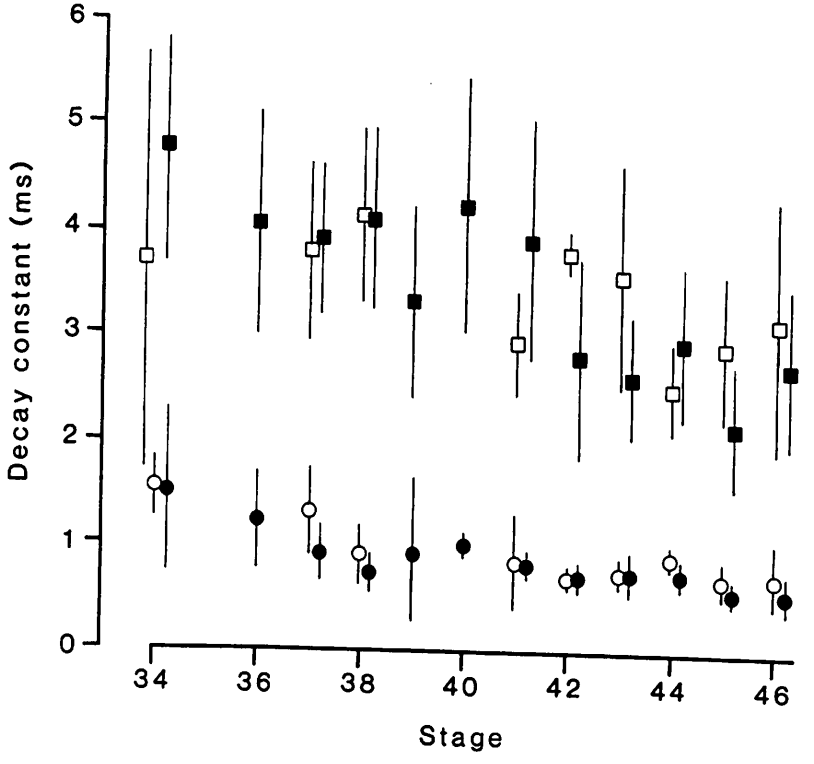
We interpret the change from day two through five to be due to a progressive increase in the ratio of fast/slow acetylcholine receptor channels. This culminates in a physiologically mature synapse which is dominated by fast channels.

During the transition from slow to fast mepcs we find many mepcs which have two components. When the components are separated and their decay time measured by our computer, the slow and fast components have decay constants of about three msec and one msec respectively. At each stage of development which produced complex mepcs, the decay constants of both slow and fast components were equal in experimental and control animals (Figure 4).

If the duration of mepc decay after stage 32 (the point at which actylcholinesterase becomes fully active) is determined by the open time of receptor channels, our results would indicate that the change in ratio of the two channel types is also occurring similarly in both paralyzed and control animals.

FIGURE 4

THE DECAY CONSTANTS OF DOUBLE EXPONENTIAL MEPCS ARE THE SAME IN IMMOBILIZED AND CONTROL MUSCLE



MEAN SLOW AND FAST DECAY CONSTANTS OF DOUBLE EXPONENTIAL MEPCS AT DIFFERENT DEVELOPMENTAL STAGES. EACH SYMBOL REPRESENTS THE MEAN FAST OR SLOW DECAY CONSTANT OBTAINED FROM ALL RECORDING SITES AT A SINGLE STAGE OF DEVELOPMENT. THE AVERAGE SAMPLE SIZE FOR EACH DATA POINT IS 8 RECORDING SITES (RANGE = 2 TO 33). OPEN SYMBOLS INDICATE CONTROL DATA, FILLED SYMBOLS INDICATE DATA FROM TTX-REARED ANIMALS. SLOW DECAY CONSTANTS INDICATED BY SQUARES, FAST DECAY CONSTANTS BY CIRCLES.

Conclusion

Since we see equivalent development of mepc decays with and without active acetlycholinesterase, and in the complex mepcs, we must conclude that immobilization does not retard or block development of function in the neuromuscular junction of myotomal muscle in the amphibian embryo.

It seems likely from this result that the embryonic motor neurons and muscle cells are genetically preprogrammed to construct a functional communication interface without having to use it, or perhaps even test it, throughout the construction phase.

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Pet Facilitated Therapy in Residential Treatment of Emotionally Disturbed Children

Linn A. Lenoir

A pet animal visitation program based on the simple systems model for community programs by Raeburn and Seymour (1979) is presented. The program allows emotionally disturbed children and adolescents in a residential treatment facility to interact with pet animals. Pet facilitated therapy has been successfully used to enhance treatment and care of clients in dependent living environments in other contexts. A search of the literature provides support for the effectiveness of pet animal facilitated therapy in the following areas: (1) establishing rapport, (2) lessening of anxiety, (3) eliciting engagement and communication, (4) encouraging heightened self-esteem, and (5) enhancing ongoing therapy by the pet's ability to give tactile reassurance, which may enable the client to express repressed emotions. Resident pet animals are often unavailable to clients in dependent living environments due to physiological, psychological, legal, and financial complications. Properly planned and implemented, pet animal visitation programs can be therapeutic for residents in environmental settings that are not able to accommodate a live-in mascot or pet.

A growing body of research indicates that pet animals have been successfully used to enhance treatment and care of clients in dependent living environments. A pet animal visitation program based on the simple systems model for community programs by Raeburn and Seymour (1979) is presented. This pilot program allows emotionally disturbed children in a residential treatment facility to interact with pet animal visitors on a regular basis.

Pet Facilitated Therapy

Pet Facilitated Therapy (PFT) is a term that encompasses a wide variety of program designs allowing for interaction between humans and companion pet animals. A growing number of helping professionals have recognized and utilized the bonding relationship between pets and people for potential therapeutic value.

Linn Lenoir wins award

History

Pet animals have been used in increasing numbers in programs as aides in therapy. The origin of animal facilitated therapy can be traced to the York Retreat founded in 1792 by William Tuke, a Quaker merchant. Animals were used as an adjunct to treatment for the insane according to Bustad (1980). They were part of the living environment and patients were encouraged to care for them.

In 1867 a treatment facility for epileptics was established at Bethel, in Bielfeld, West Germany. Pet animals, farm animals, and wild game animals were used as part of the environment to enhance the community atmosphere of the treatment environment (Bustad, 1982).

At the Pawling Army Air Force Convalescent Hospital in Pawling, New York, animals were first formally used as aides in therapy in 1942. Patients of the hospital were in care due to physical injuries as well as being victims of fatigue resulting from military service during World War II. According to Bustad (1980), the program encouraged engagement between patients and various farm animals available in the institution, as well as with the wild species of reptiles and amphibians that resided in the surrounding area. This program was sponsored by the American Red Cross.

The current popularity of the movement utilizing pet animals as therapeutic aides to conventional therapy is generally attributed to Boris Levinson, a child psychologist. Levinson began to use pet animals in the treatment of behavior disorders of children in the early 1960s. He found that by utilizing pet animals early in therapy as a bridge between himself and the child-client, he was able to speed up the therapeutic process (Levinson 1969, 1970, 1972).

Samuel and Elizabeth Corson conducted one of the earliest scientific studies to evaluate the effects of animals on patients in an institutional setting (Corson and Corson, 1979). They were among the first experimenters to introduce quantitative analysis into the realm of pet facilitated therapy. The studies undertaken by the Corsons began in the early 1970s at the Ohio State University Hospital's disturbed adolescent

unit, and later were extended to the geriatric population at the Castle Nursing Homes in Millersburg, Ohio.

The Corsons observed that adults in contact with the ailing elderly, and the mentally and physically debilitated, often tend to send negative non-verbal signals which may lead to a cycle of non-reinforcing engagement patterns. Their studies report that the introduction of carefully selected dogs, as well as other pet animals, acted as an aid to therapeutic intervention with patients who were depressed and withdrawn. The animals functioned effectively as social lubricants, enhancing social interaction among the patients, and creating a more congenial and sociable atmosphere in the institution.

In 1979, Clark Brickel instituted a different experimental design. He introduced a single pet mascot, a cat, into each ward of a hospital based nursing care facility in California. Rather than relying on the use of individual animals matched on a one-to-one basis with each patient, a single pet animal was shared by the hospital ward population. The single ward mascot was shown to have as many positive effects as the prior individual pairings. This design also provided an additional benefit, that of the relative ease of integration of a single pet animal into the institutional environment as opposed to that of the large number of animals that would be required for one-to-one pairing. Although the information obtained by Brickel in this study was gathered from interviews with the hospital staff rather than the patients themselves, the results appear positive. The experiment was viewed by the staff as beneficial to the patients in several areas. Positive results mentioned in this study include improved responsiveness by the patients, enhancement of the ward environment, physical pleasure of stroking the animal, and as an aid to reality therapy.

Friedman, Katcher, Lynch, and Thomas (1980) reported that owning a pet appears to stimulate recovery from heart disease independent of the health status of the subjects.

Aaron Katcher (1981) completed research that indicates that while talking and communication between humans elevates blood pressure, talking to an animal or petting an animal lowers human blood pressure.

Robert Andrysco (1981) studied the introduction of a pet dog to a nursing home-retirement care community. Significant improvement was noted in the areas of activity involvement, verbal communication, conversations about animals, socialization with non-nursing personnel, socialization with other residents, and socialization at mealtime. Verbal and non-verbal communication showed improvement in both the quantity (number of words and statements) and the quality (more positive responses) of communication. Response time and eye contact with the investigator also showed improvement during the course of the study. Andryso found that the presence of the dog enhanced and facilitated the investigator's relationship with the staff of the institution as well.

Salmon and Salmon (1982) published the results of the first formal patient-pet interaction program in Australia. Data from this study confirmed that having a dog in residence in a long term care ward for elderly residents had a positive effect on emotional well being and physical activity of a significant number of the patients. The residents in this study had an average age of 80 and were generally described as frail, withdrawn, uncommunicative, non-ambulatory, and showing little interest in engagement with their surroundings.

The dog promoted a greater interest in others, improving relationships between the patients and their peers, as well as between the patients and the staff. The dog provided a significant interest in common, something that could be shared and talked about safely.

A further important aspect of the Australian study was the discovery that expectations and anticipated benefits of a dog in residence can be self-fulfilling. The positive effects of the pet animal were anticipated and also realized. The negative effects of the pet animal were anticipated but failed to be realized.

The literature review shows that the usefulness of a pet animal as a therapeutic aid to therapy is limited only by the characteristics of the therapist and the client. Pets have been used: (a) to facilitate the initiation of therapeutic rapport (Corson and Corson, 1975; Levison, 1965, 1966, 1968, 1969a, 1969b; Yates, 1973), (b) to soothe clients who experience anxiety (Brickel, 1982), (c) to enhance ongoing therapy by the pet's ability to give tactile reassurance (Brickel, 1979; Levinson, 1972), (d) to help build self-esteem and confidence (Hopkins, 1981), (e) to enhance the therapeutic milieu (Arkow, 1976, 1980; Brickel, 1979; Francis and Odell, 1979; Mugford and M'Comisky, 1975; Salmon and Salmon, 1980), (f) to aid clients in settling and relaxing in a new environment (Pet Care Information and Advisory Service, 1976), (g) to elicit responses in clients who are otherwise non-communicative or who tend to deny their emotions (Brickel, 1979; Christy, 1974; Connell and Lago, 1983; Ford, 1976; Hahn, 1981; Jacobsen, 1983; Lacy, 1983; Levinson, 1972, 1979; Otis, 1983; Schaeffler, 1983; Star, 1983; Stauffer, 1982), (h) to act as social catalysts increasing the number and quality of communications (Brickel, 1979; Corson and Corson, 1975; Corson, Corson, and Gwynne, 1975; Harris, 1982; Robb, Boyd, and Pristash, 1980), and (i) to reduce stress by lowering blood pressure (Katcher, 1981).

Treatment Facility

The pet visitation program was designed to incorporate many of the above referenced uses for pet animals into a program appropriate for use in a residential treatment facility serving emotionally disturbed children. The treatment facility in this pilot project was populated by ap-

proximately forty-five children and adolescents housed in five separate cottages according to age and sex. The subjects of this study resided in a cottage housing a population of ten females, ranging in age from ten to seventeen.

The philosophy and goals of this agency reflect the desire to provide services that are designed to meet individual needs of children with emotional problems in a community based setting. The agency strives to maintain the least restrictive and most normalized atmosphere possible. Although there is one pet dog in residence on the campus of the agency, few of the chilren in care have the opportunity to interact with it consistently. This lack of interaction can be attributed to the following circumstances: (a) the dog is housed and fed in one particular cottage on campus, that which houses the younger aged males, and (b) the dog's age and poor health limits her activities and restricts her movements among the cottages.

Pet animals are not allowed in each cottage due to administrative prohibition. The lack of pet animals on campus has been recognized as a deficit by both the children in care and the staff, who are seeking to provide a home-like atmosphere.

Population

A majority of the children who participated in this study had experienced significant degrees of abuse and neglect in their lives. Many of these children experience great difficulty relating to adults and/or peers. They were often distrustful and inhibited when attempting to form relationships with others. The children in care often have presenting problems that reflect low self-esteem. Many cottage residents had been adjudicated delinquent.

Program Description

The addition of pet animals in the cottage setting on a consistent basis had been requested by both staff and children in care. Due to the prohibition of residential animals, a visitation program was suggested. The program was based on a systems model for community programs by Raeburn and Seymour (1979) and involved the following procedural steps: (a) overview, (b) needs assessment, (c) goal setting, (d) resource organization, (e) action, (f) reviews, and (g) outcome statements.

Overview

Staff members requested that pet animals be brought into the cottage on a consistent basis. Expectations of the staff regarding the pet visits included: (a) initiation of rapport and relationship building resident-to-resident, resident-to-staff, and resident-to-pet, (b) generalization of

communication and social skills learned within the pet visitation setting to other areas of the residents' experience, (c) opportunity to enjoy a relationship with a non-threatening and non-judgemental pet animal, (d) opportunity to gain knowledge about animals, and (e) opportunity to build and enhance self-esteem.

Needs Assessment

Six factions were identified as having specific interests relating to the formulation and design of a pet visitation program for the children in care. These factions included the residents, line staff, supervisor, social worker, agency program director, and representative of the S.P.C.A. (Society for the Prevention of Cruelty to Animals).

Informal meetings and group discussions were conducted to establish the desires and concerns of each faction relative to having pet animals visit the cottage. The meetings were scheduled and organized by a participant facilitator who had the responsibility for initial pilot work.

The results of this assessment showed that the children in care were mainly interested in pet animals as play objects. The other factions perceived pet animals not only as playmates, but as the basis for animal education and as therapeutic aides.

Goals

Two specific goals were established and approved of by all factions for the pet visitation program. The first goal was to enrich the lives of children residing in the cottage by the addition of the companionship of a variety of pet animal visitors once each month to the cottage environment. The second goal was to develop and implement an educational program to provide knowledge and understanding of the human-animal bond, and their mutual needs and rights.

Numerous sub-goals were established in relation to the original goals. In order to have these goals available to all factions of the system, and to guide implementation of the program, this information was maintained in the cottage staff office, available 24 hours daily.

Resource Organization

In terms of manpower, three weekend youth workers (line staff) agreed to conduct visitations and educational programs once each month. The participant-facilitator (also a youth worker on the line staff) agreed to provide an educational curriculum and resource materials, as well as to coordinate the activities involving pet visitors. The children agreed to provide care for the animals while they were at the cottage, such as food, water, and clean-up services.

The administration of the agency agreed to provide transportation for the animal visitors via cottage vehicles, and also made available to the program an area on campus suitable for the pet animal visitation meetings. They also agreed to provide basic office needs such as stationery, duplicating services, and other simple supplies necessary for the educational portion of the program. The S.P.C.A. agreed to provide pet animals for the visitations and educational materials on an as-needed basis.

Financial support was not necessary, as the factions involved provided all the necessary resources to enable the program to function on a volunteer basis.

Action

The pet animal visitation program began on January 15, 1984, and continued for a period of six months including six separate visitations. A variety of pet animals participated in the program, including dogs, cats, doves, gerbils, and a snake. All animals had health checks prior to visits. Each animal underwent a selective evaluation prior to being accepted for visits. The evaluation was based on information gathered in an interview with the pet owner related to historical information concerning the temperament of the pet, a test visit under circumstances similar to that in which they would be expected to visit, and a commitment from the owner to attend the session for which the animal was scheduled to participate.

During the first 20 minutes of each session, an educational program was presented to the entire population of the cottage, both to staff and residents. The educational segment was held in the family room of the cottage. Following this, the pet animals were briefly introduced by the pet owners and an opportunity was provided for questions and answers related to the specific animal visiting or to the topic of the educational segment.

The animals were then removed to a staff meeting room which was furnished with a sofa and several large bean-bag type chairs. Following the departure of the animals to the visiting area, the residents were asked to draw numbers to determine who would visit with the animals first. Each visitation was limited to a maximum group of three children. During the actual visitation, the three chosen children, the pet owner, and one staff member remained in the room in order to maintain general safety for both animals and children. Each group of three children was allotted approximately 15 minutes with the animals initially. Each child had the opportunity to visit the animals again for a shorter period of time prior to the animal's departure, dependent on their appropriate behaviors both with the animals during the initial visitation, and their cooperative and appropriate behavior with peers and staff while the

program was in session. The staff members determined this eligibility. Desire for secondary visits was noted by recording the resident's name on a sign up sheet attached to the door of the pet visiting room. Visits were allowed on a first come first served basis.

A variety of activities was allowed during the period of time that the children were interacting with the animals. Included were activities such as petting and cuddling the animals, playing games with the animals, walking the animals, grooming the animals, feeding and watering the animals, as well as question and answer sessions with the pet owners.

Review

Following each pet visitation program meeting, all staff members and pet owners present were asked to meet together briefly and compile a statement of participation for each resident in the cottage. This report included the degree of participation for each resident in the educational component of the program, and an estimate of her level of interest in the session as a whole. Also included was a notation of activities in which the resident engaged while in contact with the pet animals. Information was recorded regarding the resident's appropriateness with both staff and peers in the visiting room, as well as pertinent statements related by the resident regarding her treatment program or other interests.

This program log was then combined with a general overview of the particular session, including the length of the program, types of pets presented, names of participants, information on the behavior of the pet and pet owner, and any notations regarding observed problem areas.

Upon completion of this information, the participant facilitator had responsibility for editing and typing the program results, and making copies available to all factions of the program with the exception of the residents. By making information clearly and readily available to all levels of participants in the program, there was an on-going system of feedback ensured. All participants had the opportunity to suggest modifications to the program when necessary. Complete information regarding program participation was not made available to the residents due to the confidential nature of the notes on each child. However, each child was individually allowed to see log entries regarding her own participation when requested.

Outcome Statements

As this program was a pilot study rather than a formal research project, the statement of outcome resulted from gathering materials from interviews with all factions involved rather than any clearly defined statistical data from assessment instruments. Information was taken

from notes on each session, from goal attainment sheets, and from interaction with all factions following the close of the program.

Aside from the specific activities that resulted from visits for each child, several other outcomes were noted during the course of the visitation, which should be examined in further studies.

Each child participated to some degree in the program visits. However, it appears that interest in pet animal visitors declines with the increase in age of the child. The children 14 and younger participatd to a much greater extent than the older girls. Children appeared comfortable with the educational program, often engaging in anecdotal tales relating their own private experiences with animals. Staff reported that they observed the children to be very attentive during the program, being cooperative, not interrupting, exhibiting patience with peers and staff. In general, the staff reported that the cottage acquired a very relaxed atmosphere when pet animals were present. The children were successful for the majority of the time during the animal visits maintaining behaviors that were conducive to the comfort of the animals (soft voice tones and lack of sudden movements).

Residents were quick to remind peers if they were inappropriate in their treatment of the animals, and the reminders were responded to quickly and positively. On several occasions children related information during the course of the visit that they had previously refused to share with staff. Children often interacted with the pet animals in a manner similar to that in which they related to their peers. Several of the children aligned themselves with pets who were described as the most active or most passive, and exhibited behaviors similar to those they use with peers in the same circumstances. Children from rural areas appear to be somewhat reserved when visiting with animals other than dogs. This might be accounted for by their lack of experience with a wide variety of animals due to the lack of availability of these animals in their home environment. Exotic pets, such as the snake, appear to generate interest from the older residents to a greater degree than more common pet animals.

There was no incidence of injury to either pets or residents, and at no time did a child or pet have to be removed from the visitation setting.

Conclusion

The Pet Visitation Program met all the goals set out by the program factions. Six visitations were performed successfully with full cooperation of staff and residents. Rapport between peers, between staff and residents, and between residents and pet animals was established. The behavior of the residents when in the presence of the pet animals appeared to be calmer and more easily controlled than in the regular cottage setting. The residents appeared to benefit from relationships they

perceived having with the pets, in particular those children who were repeatedly approached by the same animal, resulting in a renewed sense of self-worth. Staff report that the children appear to be more able to interact appropriately with the animals than with peers or staff in many instances.

A general agreement by all factions of the Pet Visitation Program is that the addition of pet animals to the cottage milieu benefited the residents and staff of that cottage by providing opportunities to communicate and interact in a positive home-like atmosphere.

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Understanding Haiku in Western Culture
Plus an Original Haiku Sequence in English

George Grant

Introduction

The study and appreciation of haiku in English demand specific investigation beyond the parameters of the Western tradition. Understanding the difference between Eastern and Western religious and aesthetic philosophies is even more crucial to the comprehension of haiku than the extreme difficulty in Japanese translation. The purpose of haiku is to express a specific intuitive experience referred to as satori by Zen Buddhists. Buddhists do not consider satori to be an exclusively Japanese experience. Since the Japanese form and techniques are simply the means to that end and not the goal itself, the poetic expression of satori is theoretically not limited to one language. Many leading writers in the Western tradition, including Ezra Pound, Amy Lowell, Allen Ginsberg, Gary Snyder, William B. Yeats, and Wallace Stevens have been influenced by haiku and have experimented with an English form. Some of the first interpreters of haiku either misunderstood or did not develop the crucial philosophical distinctions, but many contemporary haiku poets are assuming that the essential philosophic basis of haiku may be achieved in languges other than Japanese. However, the English form of the haiku experience is still an unsettled issue.

The Historic Development of Haiku

The emergence of haiku as a separate and complete form resulted from the union of Eastern religious influences with the Japanese poetic tradition. The haiku form is technically Japanese, but due to the influence of Zen Buddhism, the philosophic origins of haiku can be traced back to India. Therefore, it is necessary to understand both the religious and poetic traditions of haiku in order to comprehend its total significance.

Zen Buddhism

Gautama, the founder of Buddhism, was actually a Hindu and his techniques are based on the Vedic and Upanishadic scriptures. Buddhism maintained the Hindu perception of the universe which is

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understood in two aspects of creation - the relative and the absolute. Buddhism teaches that the individual human ego is bound to the relative world which is no more than a cycle of conflicting opposites. The ultimate single truth can be understood only through "knowledge" of the absolute plane. The absolute is undefinable and can be known only by direct observation through intuition. Buddha's method of attaining the experience is the major difference between Buddhism and Hinduism. Buddhist theories received various interpretations as they circulated throughout India and then spread to China and Japan. Briefly, Zen Buddhism is a discipline which prepares the individual mind for the sudden, innocent experience of satori, or the momentary intuitive glimpse and realization of the absolute. The experience cannot be forced or learned and, therefore, is only realized through intuition rather than intellection. One of the ways that Zen Buddhists prepare the mind for satori is by contemplating paradoxical "koan" riddles. The founder of haiku, Matsuo Basho, refined the haiku form in order to create a similar poetic exercise in Zen that also would lead to satori.

Haiku is a refined adaptation of the opening stanza, or hokku, within the renga form, a series of "linked verses" composed by two or more poets. The use of hokku as a separate form began in the middle of the 15th century (Edo period: 1603-1868 A.D.). Basho applied the principles of Zen to hokku and refined it to the level of literature in the late 16th century.

Haiku Meaning and Japanese Aesthetic Philosophy

Haiku is more of an effect than a "meaning" as students of Western poetry understand the term. The aesthetic philosophy of haiku is based on intuition rather than intellect and is, therefore, designed to be immediately and instantly appreciated - similarly to the poet's intuitive experience of satori. As much as possible is intentionally removed and unsaid in haiku and the reader is expected to contribute meaning to the poem.

The educated reader knows what the haiku should achieve before reading it. The haiku is realized by testing the effectiveness of the poet's record. The power of haiku rests in the fact that if it has been properly composed, an advanced reader may re-experience the undefinable insight that the poet first encountered. Haiku is simply a training process that prepares the reader for a sudden moment of insight. The unique quality of haiku is demonstrated in the method of haiku training; at the end of the day, the beginning student should read some haiku until he finds one that fits his mood. Then the poem is memorized, and repeated silently while falling asleep.

Zen Buddhist Principles in the Haiku Form

The rationale of haiku techniques is directly related to the Zen Buddhist principles regarding the experience of satori. The experience of the absolute is impossible to discuss, but the state of mind the Buddhist seeks in order to prepare for satori is quite prescribable and provides the only guide for the monk, poet, or general reader. The experience of intuition cannot be forced. Therefore, haiku is simply an adjustment of the mind and attitude that will allow the intuitive experience to occur. The following principles are aspects of that attitude and are directly related to both the content and structure of haiku.

Directness

One of the most obvious characteristics of the Zen attitudes is the directness with which it treats all things. Direct experience of the world is the only desire of the Zen Buddhist, who believes that direct experience is achieved only through the senses, and, from them, the intuition. Satori is simply a flash of intuition that is produced when the objective sensory condition unifies with the subjective. Therefore, Zen strives to focus on the concrete world. The attitude of objectivity also serves to prevent any subjective intellection or commentary.

Simplicity

The experience of satori is believed to appear only after the ego is removed. Therefore, the simplicity of Zen avoids all attempts at cleverness. However, the simple, wordless attitude in Zen naturally tends to an extraordinary acuteness.

Paradox

Zen attempts to use the tension in the opposites in nature to rise above them. Paradox occurs when two objects appear to contradict each other, but may actually be observed as true. Zen seeks paradox and then uses the condition to unify the object and the subject while retaining the characteristics of the object.

Austerity

Loneliness, poverty, detachment and selflessness are used by the strict Zen disciple to remove the ego and live closely within the laws of nature. Loneliness is positive in this context and can be a blissful state for the Buddhist.

Joy, Humor, and Grateful Acceptance

Zen Buddhists believe that suffering is necessary to rise above the duality of the relative world and realize the final truths of life. Therefore, the Buddhist response to the tensions of austerity and paradox is to laugh and appreciate any circumstances that are presented to him.

Attitude to the Ordinary

Zen attempts to destroy the sentimental imagination and romatic illusion that a person may have of the world. The simple truths of life may be found in the "insignificant" situations of common everyday life.

Appreciation of Nature

The unsentimental appreciation of nature allows the Zen Buddhist to understand the simple laws of the universe while being free from man-made dogma and ideology. Directness, simplicity, paradox, austerity, grateful acceptance and the ordinary are all fully experienced in a life close to nature.

The aforementioned attitudes are found in all Zen related art forms. They are both the cause and the effect of haiku form and content. The individual principles are impossible to separate and are not confined to one of the many haiku techniques. They are interrelated and are largely responsible for the unity of haiku.

Haiku Techniques

The haiku form is organic in that the content is reflected in the form. All the techniques used in haiku are designed to reproduce the exact sensory and psychological conditions at the moment of satori. The experience of satori is spontaneous and based upon the immediate acceptance of external conditions. In a pure haiku, when a poet is inspired, he strokes the paper with the brush and does not pause until the poem is completed. Many of the following characteristics and poetic devices can be examined separately, but the reader must learn to perceive their interrelationship, which truly is the experience and art of haiku.

One Event, Happening Now

The glimpse of intuition is immediate and must be confined to one specific event occurring in the present tense.

Simple Diction

Buddhists believe that intuition is a process that works beyond the intellect. Therefore, simple, basic words are used rather than clever or philosophical statements. Metaphor and simile are comparisons that are not included in haiku because they do not describe the immediate experience.

Natural, Concrete Imagery

Buddhists consider sensory experience and intuition to be the only methods of direct experience. The directness of Zen leads to a totally objective state, where the senses are responsible for the leap to intuition.

Haiku Length

Since the glimpse of intuition in haiku occurs in a single moment, the poetic expression of that event is limited to one breath. The Japanese standard is based on an average of 17 utterable syllables per breath, but about one in every 25 poems will vary by a few syllables.

Three Experiential Elements: What, When & Where

Every haiku must specify the three experiential elements of place, object and time that were responsible for the concrete experience. The conditions of what, when and where do not need to be presented in a specific order, but they must be unified and interconnected.

Thought Pause

One of the most misunderstood and overlooked techniques in haiku is the deliberate "thought pause," or caesura, that allows Niku Isshoo, - "two parts to become one whole." The leap to intuition is related to the contrast and relationship of two ideas. The greatest single feature in haiku may be its power of suggestion, which is caused by the association of the two ideas. Without this relationship between the two ideas that "spark" the leap to intuition, haiku is no more than a brief statement. The unsaid aura that permeates haiku is often compared to sumi painting, in which only a few ink strokes appear to fill the entire space on the silk.

Change and Permanence

The two principles of the Basho school of thought were change and permanence. Basho was developing a new poetry, and his attitude applied to Zen Buddhism and also to the Japanese poetic tradition. In every haiku, the eternal, or "general condition" in the poem must be intersected by the temporary, "momentary perception" of that condition.

Kireji, or Cutting Words

The importance of the thought pause technique is demonstrated very clearly in Japanese haiku. The thought pause is divided by specific "cutting words," called kireji, which are easily recognized by the Japanese reader. Unfortunately, there is not an exact English equivalent for kireji and translation does not make the dividing mark totally clear. Some English translators feel that accurate punctuation may effectively replace the "cutting words" and will help the educated reader to locate the thought pause.

Grammatical Ellipsis

The poetic thought pause is further marked by a grammatical ellipsis. The ellipsis is located at one point in the poem where unnecessary words in the possible prosaic syntax are intentionally omitted.

Seasonal Theme

The concept of the seasonal theme that symbolizes man's oneness with nature has been refined throughout the history of haiku. One specific word was used in ancient Japan to identify one of the four seasons. As haiku theory evolved, a "seasonal feeling" became accepted as a more appropriate technique by which to create the illusive quality that permeates haiku. It is not required, but a season word may exist within one of the three experiential elements. The seasonal theme is also not exclusively related to the thought pause technique, but they must support each other. The major function of the seasonal theme is in unifying the poem as a whole. The organic force that permeates the poem is always related to the seasonal feeling.

Haiku Organization

A haiku poem may have 17 syllables and the three experiential elements but still fail to be a well-realized haiku. The proper synthesis of all the separate elements is the art of the haiku. Word order is very important in the crystallization process.

Perspective - Horizontal and Vertical

Haiku is so comparable to painting that many haiku poets drew pictures for their poems. Many of the same techniques are used for the realization of space, direction, dimension, atmosphere, and perspective. The reader should imagine a frame around the poetic event in order to grasp the dimension of the imagery. Much of the immediacy of haiku is achieved through spatial relationships. Haiku may be classified as either "vertical" or "horizontal" images. A combination of the two is also possible if it is significant in the actual experience of satori.

Chronology

The emphasis in the poem may be realized through the order in the presentation of the images. The exact moment of the intuitive insight is often shown through the progression of the events in the poem.

Turning or Line Breaks, & the 5-7-5 Syllabic Form

The line break, or turn, in haiku does not occur simply for mechanical reasons, related to the 5-7-5 syllabic pattern, but rather for those arising from the material itself. It is important to realize that the Japanese haiku is actually written in one line. Although the "breaks" do occur in Japanese haiku, the three line appearance of English and "romanized" (a - z) Japanese verses are only the result of translation. The 5-7-5 syllabic form is an organization process based on renso, a Japanese term referring to the associative power of words, and is a far more important aspect of the turn than the unstressed quality of the Japanese language. Turns separate the aesthetic or sensory units and the thought pause divides the two ideas in the arrangement. The line break may be based on the presentation of each experiential element, the implied relationship between them, action, sound, rhythmic effects, the thought pause, or any combination of these devices.

Sound Effects

Since the "meaning" of haiku depends on its effect, rather than its statement, sound is very crucial to both Japanese and English haiku. Although the haiku form is brief, it is acute and demands that every possible technique in sound effect be exploited.

End rhyme and a rhyme scheme are not required in haiku. However, in English, haiku rhyme may serve an important role in echoing the action, emphasizing key words, and intensifying or clarifying the imagery.

The effect of vowel and consonant sounds (assonance and alliteration), must be handled skillfully in order to bind the lines and support the condensed imagery that is characteristic of haiku.

Onomatopoeia, an imitation of the action by the sound it makes, is one of the most significant features of the Japanese language and also should be applied in English haiku. The function of onomatopoeia may also represent movement, or physical sensations other than sound. The imitating effect usually reinforces the poem after the meaning is realized through other poetic observations.

The acute, reverberating imagery in haiku is especially conducive to synesthesia, a "blended feeling" created through intersensory relationships, such as visual images of sound. All people do not experience the blended sensory effects of synesthesia, but it may occur a little more easily in haiku. The obvious patterns of sound in haiku may be appreciated as a type of "painting." If the reader allows the "meaning" associated with the words to fall away, a "tone poem" of reverberating musical patterns may be experienced.

Haiku Rhythm

Haiku is not a metrical verse form. The movement in the poem is an organic representation of the conditions immediately associated with the moment of satori.

Haiku Themes

Basho used haiku to express one of the most elementary concepts of Buddhism - the impermanence of life. Therefore, haiku is a poetry of the heart, focusing on mood and suggestion, rather than the intellectual aspects of the mind. Basho insisted that a proper haiku must include (1) inspiration, (2) fragrance, (3) reverberation, (4) reflection, and (5) lightness. ("Fragrance" is experienced through synesthesia when the poem is appreciated as a sensory effect alone.) One of the Furyu, or Zen moods, must be developed in a haiku. The Zen moods are (1) Sabi - solitary and quiet, (2) Wabi - depressed or empty, (3) Aware - intense, nostalgic sadness connected with autumn, and (4) Yugen - the perception of something mysterious and strange.

Conclusion

Dr. Donald Keene of Columbia University states that haiku is a poetry for the "connoisseur." Haiku demands a great deal of contribution from the reader. This does not, however, present a unique limitation for Western readers, because experienced Japanese readers also feel that it takes years to successfully read or write a haiku. The greatest difficulty

is probably the absolute condition of satori. Since haiku is based on an undiscussable experience, the poems can only be judged by a person who has experienced that state. Until satori is actually realized, haiku can be measured only through its expression of the Zen preparative philosophy.

In the final analysis, however, haiku cannot be totally associated with Zen Buddhism. Even according to Buddhist theories, if satori is possible at all, it is possible for anyone and is not an exclusively "Japanese" or religious experience. Satori is an acute moment of insight and that experience is not dictated by cultural dogma; intuition is a natural human ability that is not confined by religion. The difficulties of haiku in English are not unsolvable. The English development of haiku may be compared to the process that produced the English sonnet from a similar Italian form. Rather than imitating the Japanese haiku form, many English poets are recognizing both the limits and assets of the English language in order to produce an effect that fully expresses the purpose of haiku. The Japanese language does not develop the rhyming features that are available in English, but rather than trying to ignore their obvious presence, English poets are working within those boundaries for the maximum realization of the haiku. In North America there are currently ten journals or associations that are specifically devoted to haiku. "Modern Haiku" of Madison, Wisconsin, has received three consecutive awards for excellence from the National Endowment for the Arts. "Frog Pond" is another leading journal and is published by the Haiku Society of America, which is based at the Japan House in New York.

Haiku is an example of an art form that must be appreciated with consideration of the "intention" of that form or author. The historically "Japanese" poetic experience also illustrates that the uses of poetry are not universal. Both the goals and methods of all Japanese art forms seek to experience the absolute. Haiku is both a spiritual and poetic tradition and, therefore, cannot be judged exclusively within the aesthetic philosophy of the Western tradition. Western readers do not have to accept the Japanese aesthetic philosophy, but they must understand its philosophical intention in order to appreciate that poetic expression in haiku. Haiku may appear to be overly simple when in fact it is the result of extremely demanding and challenging classical restrictions that have been developing for thousands of years. The future of haiku in the Western tradition is uncertain, but if any momentary experience as undefinable as intuitive insight can be precisely expressed in language, the haiku form is certainly worthy of Western attention.

Haiku poems are usually inserted within the prose context of the poetic diary or travel journal. They are usually not titled unless presented as a series of individual moments unified by a common theme which thereby creates a cascading effect.

AFTER THE DARK NIGHT

Sun shining only
on wet snow up on the ridge -
the glare through the fog.

Trees away in the breeze
high above clouds drift away -
the sun coming down.

After wind and rain...
beads of water on spruce boughs
shining in the sun.

The narrow ridge line -
only sun fills the blue sky
between here and there.

By George Grant

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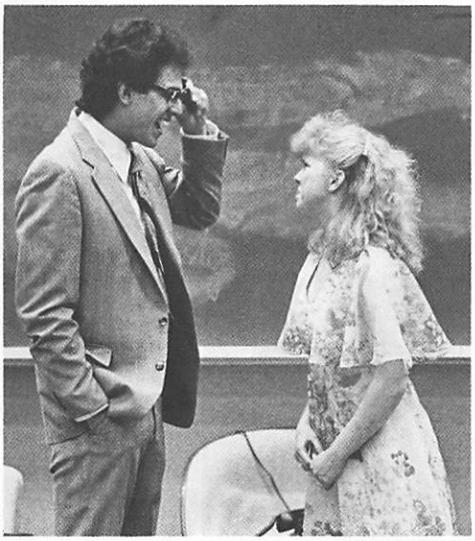

UAA Theater students in scene from "Crimes of the Heart"

Where's the Doctor?

Kathe Peratrovich-Dooley

It was the first and last time Jean Persons landed in Tanana wearing a suit and heels. As she climbed down from the small Cessna aircraft, her dog Tinker darted back and forth in front of her and she stumbled momentarily, much to the amusement of the welcoming committee gathered at the landing strip.

The new doctor had arrived.

After graduation from Louisana State University School of Medicine in New Orleans, Persons had worked as a government doctor on a Navajo reservation near Gallup, N.M.

"I said, 'I'm not going into private practice,'"recalled Persons as she reminisced recently, "I'm going to travel first."

After nine months on the Navajo reservation, Persons got itchy feet. She sent off applications to government agencies in Alaska and Japan. Alaska accepted her first.

When she walked into the Bureau of Indian Affairs (BIA) office in Seattle for an interview, no one would wait on her. But the youthful Persons was used to dealing with people who didn't believe she was a doctor.

"I'd do a beautiful physical and then the patient would say, 'Well, when am I going to see the doctor?'" she said, "and I'd tell them, 'You HAVE seen the doctor.'"

She had her pick of three assignments in Alaska. All three villages were without doctors.

"I picked Tanana because it was in the center of the state," she said. During the course of her briefing in Seattle, Persons was told that supplies were shipped to Tanana only once a year by barge. When she arrived in early May the village would be out of fresh meat.

The only way she could procure any was to buy illegal moose meat, shot out of season by Natives.

A system had been established whereby the trader in the Northern Commercial store in the village would issue a false bill of lading for whitefish. When Persons paid the bill, she would receive the moose meat. The only catch was that if she was caught, the BIA wouldn't stand behind her. She would be on her own.

"I bought moose meat for my patients," she said, "because they were hungry and sick, they needed the moose meat."

Kathe Peratrovich-Dooley's article was written for Wallace Allen's Journalism 301 *Reporting* class.

When Persons arrived in Tanana, the village had been without a doctor for almost a year. She was in charge of a small clinic and a 30-bed hospital.

Fifteen beds were for tuberculosis patients and the rest were for general patients including maternity and orthopedic cases.

"I cast patients and I delivered them," she said, "and I sewed them up."

The staff was composed of a head nurse, six regular and two practical nurses. When she walked into her office the first time, she found her chair covered by a sheet.

"Somebody had just died," said Persons. "But before he died they put him in the sitting position because the planes were small and if they were to send him home by plane you put them in so they could sit in the front with the pilot."

Persons had been introduced to the common Bush practice of putting the dying person into a sitting position before rigor mortis.

Since Tanana was the regional center for all the Bush communities in the area, Persons dealt with communities in the area by radio phone. On a regular basis she placed calls to a "whole list of villages," checking to see if they had any medical problems.

Her contact would be a teacher, a clergyman, or a trader who had been given the responsibility for medical care in the village. At their disposal was a kit with medication provided by the BIA.

"So much sulfa, so many ointments, so many whatever," Persons said. "And you had your list of what they had."

It was Persons' job to diagnose and prescribe medication for the villagers by radio.

"We knew what their capabilities were," she said "and if there was a real emergency, then we'd have to send a pilot to get them to the hospital."

She found it difficult to practice long-distance medicine, but often she was the only link with the outside world for the communities that were anywhere from 50 to 250 miles away.

"You learn that what you have to do, you have to do," she said.

A few months after Persons arrived in Tanana, she was approached by a Fairbanks man, Garfield Hansen. Hansen was a pilot who owned his own plane.

"I don't know how he heard about me," Persons said. "But he came down to the hospital one day and said, 'Hey Doc, if you will use me I'll bring my trailer down from Fairbanks and set up shop. Then you'll have a plane here."

A bargain was struck and Hansen moved to Tanana.

Hansen and Persons spent many hours flying around in the Bush. "He did 80 percent of my flying," she said, "until he died when his plane crashed on the Yukon during a whiteout."

She kept a medical case packed and ready to go at all times - in a pillowcase.

"The first time we went on a field trip," she said, "I put everything neatly in boxes and carried them down to the plane and they wouldn't fit."

But a pillowcase full of medical supplies could be squashed and stuffed into a little four-seater quite nicely.

There was never a dull moment.

One cold winter night her radiophone crackled with a call from Nulato.

"Doctor, doctor," said the heavily accented French voice, "I have a problem."

"It was a Catholic priest, Father Beau, calling," said Persons. "He had a pregnant woman who was bleeding."

Persons was concerned because she knew she would have difficulty treating the woman if she hemorrhaged. She told the woman they could either wait and deliver the baby in her cabin, or they could take a chance on flying back to Tanana. The woman opted for Tanana.

The airstrip was a litle distance from the cabin so they wheeled the patient out to the plane in a wheelbarrow. Two of the four seats were taken out. Persons didn't have a seat, so she stood in a half crouched position over her patient.

It was almost 40 degrees below zero when they took off into the pitch black darkness.

"Hansen had the heater on but it wasn't very warm," she said.

All of a sudden, the plane hit an air pocket. As it lurched around, the patient told Persons, "I think that did it. I think the baby comes."

"So I said okay," said Persons, "and gave Hansen the flashlight." She said Hansen was so modest he wouldn't turn around, so she had to reach up and position his hands correctly so she could see what she was doing.

Fortunately it wasn't the woman's first child. "She'd had babies before, you know, so it wasn't that big a deal," said Persons.

After delivering the baby, she wrapped it in blankets and her "red parky." The placenta wasn't delivered yet and the woman was bleeding so Persons located some vials of medication and the patient held them for her as she filled the syringe.

"She was a very cooperative patient," Persons said.

The umbilical cord had to be cut next. She rummaged around in the dark but she couldn't find her scissors.

"I looked all through the pillowcase back there," she said, "and of course it was sort of awkward and I kept losing the baby because it was so tiny.

"The baby was in my parky which kept sliding. There wasn't any light back there. I kept fishing the baby out making sure it was all right."

Hansen finally asked, "Do you want my knife?"

"I said, 'Fine, Hansen, I'd love your knife.'" So she cut the cord with his pocket knife.

Somehow the news got out and the story was printed nationwide.

"I got so many penknives sent to me," she said. Her favorite knife came from the surgeon general of the United States.

Her most "famous" trip as she puts it, occurred when a plane piloted by Tuffy Edgington crashed near the Yukon river. Edgington's pregnant wife and an older woman were with him.

Persons doesn't remember how the word reached her. She does remember that it was 50 degrees below zero. Normally all planes were grounded when temperature fell below minus 25. So Persons and one of the hospital employees, Basco Minook, decided to use a dogsled to travel up the frozen river to the crash site.

Just before she left, someone handed her a revolver and said, "Don't forget about the wolves."

"I had my parky on," she said, "I had morphine and all my supplies. I kept a whole bunch of plasma between my legs to keep it warm."

With Basco running the sled, she traveled for six hours to reach Tuffy.

In the meantime, a Fairbanks pilot, Bob Byers, decided he would try to reach the crash site by plane.

"He was really a good pilot," said Persons. "He landed on the Yukon and it was dark, but he found a patch of broken ice that was big enough. And he brought a friend with him."

Tuffy had been "really squashed up into the landing gear," according to Persons, but the two women pulled him out of the plane. Somehow they managed to drag the 250-pound unconscious man up a steep bank into a little cabin.

"He never would have made it," said Persons, "if they hadn't moved him."

When Persons arrived, she got Edgington stabilized. Byers and his friend chopped down two trees, rolled a blanket around them and loaded Edgington onto the makeshift stretcher.

Front and back seats were taken out of the plane, and the patient was loaded in.

"We got the IV's going," said Persons, "and Byers flew the two of us into Fairbanks."

Edgington was loaded into a waiting ambulance there. As Persons climbed in after him, she borrowed $10 from Byers for cab fare to get back to the air field.

After turning her patient over to other doctors, Persons decided to get something to eat before she caught a cab.

"It was around 6 or 7 in the morning by then," she said. The only cafe open was in a seedy part of town. But she was hungry, so she sat down

at the counter. After she ordered orange juice, Persons unzipped her parka. The other customers seemed to be staring at her.

"I had this revolver sitting in my pocket," she said, "and I'd forgotten about it completely."

She remembers being a little flustered because everybody was looking "and it was obvious they were concerned what I was going to do with this revolver," she said. "And I know I looked ratty, I'd been up for so long.

As she started to pull her parka back on, all the syringes she'd used to inject Tuffy with morphine fell out of her pockets.

"At that point," she said, "I just put some money on the counter, got up, picked up my syringes, put the revolver back, pulled on my jacket thinking, 'I quit!' and left."

Ironically, about a week later, Byers slipped and broke his leg when he fell from a roof. He ended up in the bed next to Tuffy.

Cy Hetherington was another Bush pilot who flew Persons into the villages. He crashed into the Yukon river as he was transporting a nurse and a sick baby into Tanana for treatment.

The faithful Hansen took Persons and her head nurse to the scene of the wreck. As they circled, Cy waved so they would know he was okay.

They landed about 40 feet from the downed plane.

"There was heavy, heavy snow on the river," Persons said. Every time she took a step in the snow she would sink in up to her hips.

Persons made many trips back and forth between the planes as she tended her charges. It wasn't long before she had lost both her mukluks. But she continued to traipse back and forth in her woolen socks.

The snow was so deep a rescue plane had to be dispatched because Hansen's plane couldn't take off with the added weight.

A radio call for help to Tanana was relayed to Fairbanks and an air rescue plane was dispatched along with a helicopter.

The big plane couldn't land on the frozen river, according to Persons. The helicopter would have to ferry people from the ground to the bigger plane.

"It was the first time a helicopter of this size had done a river landing," said Persons, "so it was quite an event for the Air Force."

Finally, around three in the morning, the helicopter was able to get close enough to the ground to load passengers. After the nurse and the baby were transferred by helicopter, additional passengers were added one at a time until only Hansen was left on the ground.

"When we left," said Persons, "he was able to take off because the plane was light enough then."

After the patients were settled in, the medic on board turned to Persons and said, "Hey doc, you'd better take off your pants."

He'd noticed that the pants Persons was wearing were stiff with ice and he was concerned that her legs would freeze.

She took off her wet clothing and wrapped herself in a blanket. Then just before the plane landed in Tanana, the medic turned around again and said, "Hey doc, you'd better put your pants back on, they might have cameras."

So the weary Persons put her pants back on and combed her hair. When they landed, they were met by "all these flashing cameras."

"It was much better," she said, "to have your pants on when you have to get off (a plane) like that."

Although she didn't make the news when she threatened to shoot a man in the Pribilofs, it's still an interesting tale.

Persons accepted a temporary assignment to fill in for a sick doctor in the Pribilof Islands. Before the doctor left, he handed her a pistol and warned her to keep it by her side because the Russian Easter was coming and the villagers hadn't had anything to drink for 40 days. Persons was a little dubious about the whole matter, but she agreed to keep the gun.

Her quarters were on the ground floor of the hotel, "a huge building that creaked and groaned in the wind," which blew often. She was the sole occupant as the other tenant, a local dentist, was out on leave.

The halls were dark and there were no locks on the doors or windows. So she kept the gun on a chair next to her bed.

Easter night, she woke up and heard footsteps going back and forth very slowly outside her bedroom window. Finally there was a tap on the window.

When she asked who was there, a man replied he was having heart problems. After listening to his symptoms, Persons told him she didn't believe him.

The man meekly replied "okay" and left.

She laughed as she recalled that what she didn't tell him was her hands were shaking so badly she couldn't hold the gun.

Persons spent 10 years in the Bush. Now she has a busy, thriving practice as a general practitioner in Anchorage. Her life hasn't become dull yet. Last year, she and her husband, Dr. Robert Whaley, took a motorcycle tour through Hungary, the Swiss Alps and East Germany.

Who knows where the lively doctor will end up next? Chances are she won't be wearing a suit and heels.

The Rise and Fall of the Kodiak King Crab Fishery

Debra Sherwood

Only a few short years ago in Kodiak thoughts of king crab naturally led to thoughts of money. Everyone from experienced fishermen to young hopefuls pounding the docks in search of their first fishing jobs, to the merchants in town, looked forward to another king crab season and the big bankrolls circulating soon after.

Rumors of doom had crept into fishing conversations throughout the summer of 1983. As it had each summer since 1974, the Alaska Deparment of Fish and Game was conducting a crab population survey to determine the quota for the king crab season that fall.

The numbers of legal-sized males found were dismally low and worse, many females incidentally caught were without eggsacs. But what worried biologists most was an apparent lack of younger crabs, or recruits, the generations that replace the stocks of older crabs taken each year.

In recent years the stocks of king crab had declined, but the fishery had weathered a slump in the early 1970s, rebounding to gross more money than ever before.

Fish and Game's announcement following the 1983 survey stunned the community of 6,500. Instead of reducing the catch limit as people had feared, there would be no king crab season at all for 1983.

Last year, 1984, the same announcement was made with the footnote that no king crab seasons could be expected for the next four years.

Many families lost half their yearly income. Fishermen were forced into some hard career choices, while biologists were left trying to sift through the possible causes of the sudden decline. In Kodiak, a short, sweet chapter had suddenly ended.

But during its heyday nothing could beat king crab.

Starting out small, a supplement to the salmon fishery, king crab quickly caught on after World War II. In 1950, Kodiak waters yielded 50,000 pounds of king crab. By the end of the 1950s the catch had increased to 21 million pounds, and reached an alltime high in 1965 of 97 million pounds in the Kodiak registration district (166 million statewide), according to Fish and Game statistics.

From 1960 to 1982 the price rose from eight cents a pound to a high of $4.65 at the close of the 1982 season.

It was Lowell Wakefield, owner of Wakefield Seafoods, who is generally credited with giving American fishermen the incentive they needed to go after king crab in earnest. In the early 1940s Wakefield

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Debra Sherwood's article was written for Wallace Allen's Journalism 301 *Reporting* class.

was the first to produce frozen king crab, more appealing to consumers than the canned product.

According to Wakefield's daughter, Mary Ratcliff, Wakefield rode a train with the frozen crab to the East Coast.

"He would make an appointment with the chef in a restaurant and show him how to cook it," she said.

It was Wakefield's first marketing efforts that helped bring national attention to king crab. The demand for it stirred fishermen into action.

Oscar Dyson was one of the first to seriously enter the fishery in 1948.

"It was curiosity at first," he said. "Something to do after the salmon season."

Dyson says there were no regulations on the fishery back then, and the first method used to catch the crab was dragging nets accross the ocean floor.

Dragging proved too "non-selective," Dyson said, and it was the fishermen themselves who turned to pots, experimenting with different shapes and sizes.

Eventually they settled on square pots, seven, eight, or nine feet on a side and three feet high, weighing 500 to 700 pounds each.

Crab must be kept alive until it is processed, and today's crab boats have "live tanks" that circulate a continuous supply of fresh seawater, keeping crabs alive onboard for several weeks.

But Dyson remembers the old days when fishermen would build floating cages from pilings and webbing, anchoring them in bays until another boat called a tender took the crab to the cannery.

Until 1965, the maximum length for fishing boats in Alaska was usually 50 or 60 feet. When Dyson launched his 100-foot Peggy Jo that year, it was considered an unwieldy monstrosity by other fishermen.

"Now the Peggy Jo is a small crab boat compared to some of them," he said, referring to a bevy of boats that joined the fleet in the 1970s.

The decline of the crab industry has illustrated that bigger is not always better.

"We built the Peggy Jo for diversified fishing," Dyson said. "Some of the other boats, what they're calling dinosaurs today, are too big and costly for other fisheries."

After the record year of 1965 when 175 boats caught 94 million pounds of king crab around Kodiak, the fishery went into a decline which bottomed out in 1971 when 89 vessels caught 11 million pounds, at an average price of price of 39 cents a pound.

Over the next 10 years the catches varied, climbing gradually to 24 million pounds in 1975, then slipping to 12 million in 1978, only to climb back to 24 million in 1981.

The price reached $1 a pound in 1976, an event that was marveled at.

In 1981 the Kodiak king crab fishery grossed over $48 million at $2 a pound on a catch of 24 million pounds, compared to the $12 million earned on the 1965 record catch. Even in 1982, as the fishery lay on its deathbed with a total catch of only nine million pounds, the average price that season of $2.75 a pound ($4.65 at the close of the season) grossed fishermen $33 million.

Over the years the fishery's increasing importance created a change in fishing attitudes.

During the early 1960s, crab season was open all year, and boats came and went at a leisurely pace. But in the 1970s, lower catch quotas created ever-shortening seasons. It meant more money was made in less time. It also meant increased competition, and crab fishing became arguably the most risky of fisheries.

By the mid-1970s seasons lasted only a few weeks and boats took to fishing around the clock in almost any kind of weather. Crews maneuvered the 700-pound pots in seas up to 25 feet and more.

Jerome Rudloff says he has been crushed against the rail by sliding crab pots. He has spent a night in the Bering Sea drifting and praying in 70-foot seas.

Fishermen have gone over inside pots they were baiting. Any number of things can go wrong.

"You become very dependent on your fellow workers," says Andy Kuljis. "Your life is often in their hands."

But the money always outweighed the risks.

"I've made $30,000 in a six-week season, and I wasn't even a highliner," Kuljis said.

But times changed. What happened to the king crab?

Marty Eaton, regional shellfish biologist for Fish and Game in Kodiak, said a king crab is six or seven years old before it is legal size.

"In 1980 and 1981 we weren't getting any small crabs in the survey," Eaton said. "Five or six years ago something happened to the young crab. We don't have any new recruitment and we're into 1985."

Eaton says the problem is worse around Kodiak.

"Bristol Bay is another story," he said. "That stock has turned around and seems to be on the rise again."

Guy Powell, 51, is a retired Fish and Game biologist who studied king crab for 30 years in the waters around Kodiak. A scuba diver, Powell has observed the migratory and mating habits of the king crab throughout its lifecycle. He is responsible for almost everything we know about king crab.

He blames the loss in part on fishing patterns that stress the taking of older male crab.

King crab start out as barely visible free-floating creatures that are extremely vulnerable to the feeding habits of other fish. As they grow they molt, or shed their shells, to accommodate their larger size. Smaller crab will "pod-up" as a protective measure, joined together in a round mass

rolling across the ocean floor. Pods may number 8,000 individuals.

The crab mature sexually at about five years. Females continue to molt annually to mate, but males only molt when they need room to grow, sometimes skipping a year or two.

In his studies, Powell discovered that only the "skip-molts" will breed during the annual mating season. He found that males who molt in a given year don't even migrate to the breeding grounds, but congregate in another area.

Powell contends that the "exploitation" of the crab stocks through fishing has altered the breeding patterns.

"In a virgin population before you fish you have a ratio of one to one, male to female," he said. "After you take 50 percent of the males, the ratio becomes one male to two females, and when 90 percent of the females are taken, it becomes one male to 10 females."

He said he found, in a controlled study, that a male could service seven females and after that there was a marked decline in egg production.

"And that was when we delivered all the females to the male," he said. "They didn't have to go searching the females out."

Powell says crab travel like armies, marching across the ocean with the young in pods taking up the lead, followed by the females, and the males bringing up the rear.

"You've got a area of 27,000 square miles, the crab concentrated in several schools, and 300 boats, you don't know where they're gonna fish," he said. "When you look at the entire catch it doesn't look like much, but 50 or 60 percent of (the males in) an entire school can get fished out in one season."

Powell said he is concerned about the "overall depletion of nutrients" from the oceans of the world.

"We've harvested millions and millions and millions of pounds of fish and never put anything back. I think it would be stupid to think the removal of these animals had no effect," he said.

Other theories about what happened to the crab include a rise in the water temperature, parasites, and predators.

Powell is doubtful about the water temperature theory.

"There are very little temperature studies done," he said. "I've been studying the temperature around Kodiak for 14 years, but it's not conclusive."

Eaton says that in some areas where barren females have been found the biologists think the cause may be "a little worm, a parasite."

"We don't know how widespread it is," he says. "I wish we were increasing the level of study, but state funding is down for that."

Fishermen like Rudloff and Kuljis think part of the problem is the explosion of the populations of predator fish like halibut, cod and pollock.

Fishermen have reported catching halibut with "bellies full of baby crab."

The loss of king crab income has forced many fishermen to diversify or get out of fishing. Many have made large commitments, in terms of new gear purchases, to dragging for pollock and to longlining for halibut and cod.

Dyson says he is "just storing" his 400 crab pots for now.

"There is very litle chance we'll be using them in the near future," he said. Instead, he is now part of a joint venture with Polish fishing interests.

"I call it a last phase," he says. "Bottomfish is the last undeveloped fish for American fishermen. There's no other place to go now."

Jack Peterson, Myrna Robinson applaud student

Organizational Requirements for Southcentral-Interior Alaska Electrical Economy Interchange

Max Foster

This paper defines power pooling and discusses the potential benefits. It reviews the economic and political factors involved in developing a power pool. It sets out the development of a power pool as an evolutionary process. Three methods for allocating the benefits from economy power interchange are shown. Finally, the current power pooling situation in Southcentral and Interior Alaska is discussed. *

What is Power Pooling?

Electric utilities in the U.S. have been interconnected since the early days of the industry. Samuel Insull installed the first high voltage transmission line in 1911. These interconnections are a natural outgrowth of the economies of scale inherent in the production of electricity. Interconnections result in better system reliability at reduced cost.

Reliability requirements dictate that the utility be able to carry its peak load without the services of its largest generating unit. The utility must maintain an operating reserve margin in case of unexpected load increases or equipment failure.

Efficiency requirements generally dictate that the utility use its largest generating units to carry its load. The possibility of large scale outages increases as the size of units on-line increases relative to the overall load. The conflict between reliability and efficiency creates a cost tradeoff which can be mitigated by interconnection.

Max Foster's project was completed for Business Administration 610, *Organizational Theory and Behavior*, Dr. Garth Jones of the School of Business, Instructor.

**The first version of this paper was written in 1982, before the development of a power sales agreement between ML&P and CEA. An appendix in that version showed the potential benefits of a power interchange agreement between the two utilities for the utilization of Beluga gas and existing generation capacity. Subsequently, the utilities have negotiated a power sales agreement as suggested in the paper. They also have cooperated in ML&P's acquisition of Unit 8, and are jointly assessing the possibility of a merger.*

Interconnections operationally combine several smaller systems into a larger system. This creates problems between the utilities involved. These problems are technical, legal, political, and economic in nature. The utilities enter into formal or informal agreements to resolve them. Generally these agreements are called pooling agreements and the group of utilities involved is referred to as a power pool.

TABLE 1

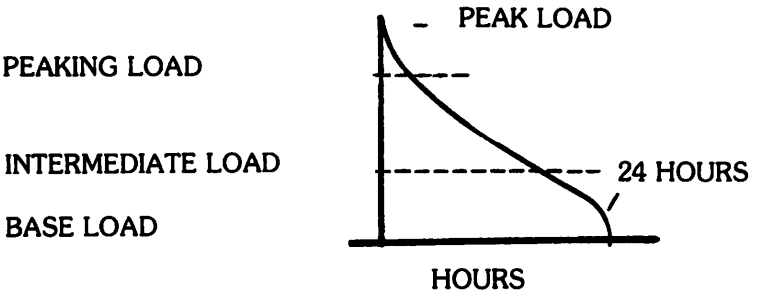
AGREEMENT TYPE	INCREASED RELIABILITY	REDUCED CAPACITY COST	REDUCED ENERGY COST
Purchased Price	X	X	X
Capability Exchange	X	X	X
Economy Interchange	X		X
Dump Energy			X
Emergency Power	X	X	
Standby Power	X	X	

The specific form of a pooling agreement depends on the intended gains expected from the interconnection. Gains may be intended to 1) increase operating reliability, 2) provide assured generating capacity, or 3) reduce energy costs. Table one summarizes the forms of pooling agreements and the gains expected from each form. Sometimes power exchanges occur between utilities with non-contiguous boundries. In those cases an agreement is required for the use of transmission facilities between the utilities. This is called a wheeling agreement. Additionally, special services may be provided by one utility for the entire group.

The primary gain from interconnection is from the economic dispatch of generating units. Throughout a typical day the demand upon the pool's generating resources varies. This variation is a function of the interactions of the demands of the different classes (residential, commercial, industrial) which each utility in the pool faces. The more diverse loads the less the variations in the daily load curve. The more coincidental the load the greater the variations in the load curve. The cumulative daily generation requirements can be related to the available capacity using the load duration curve. As figure one illustrates the generation sources can be classified as base, intermediate, and peaking capacity. Baseload units generally are very efficient with high capital costs. They are intended to run most of the time. Intermediate load units are less efficient, but with lower capital costs. Peaking units are the least efficient, but have the lowest capital costs of all. The economic dispatch process requires that the units be placed on-line so as to minimize the systems

incremental fuel costs. This requires that the units be dispatched in "merit order" with the lowest incremental fuel costs first and the highest last.

FIGURE 1
LOAD DURATION CURVE



Another gain is from reduced requirements for spinning reserves. Each utility operating alone would have to provide enough on-line reserve to equal the capacity of its largest operating unit.

If several utilities jointly operate and the largest on-line unit's capacity does not increase in proportion to the load served the overall reserves required will be reduced.

There is a similar long term gain in avoided capacity costs. Generally, a utility plans to construct enough capacity to operate without the services of its largest unit. By consolidating capacity the pool reduces the capacity required to meet that objective.

Lastly, interconnection allows for larger more efficient generating units. Consolidating the load duration curves of several utilities effectively increases the size of base load units which can be built. While this can offset the reduction of capacity reserves from pooling, the increases in operating efficiency usually merit the larger sized unit.

The economic incentives inherent in power pooling have resulted in interconnection of most of the contiguous United States since World War II. This process has not been painless, however. Economic and political issues have risen which have resulted in a variety of pooling types, rather than a homogenous nationwide power pool.

Economic Issues

The disparity in pooling benefits between large and small systems may discourage their interconnection. Such an interconnection may result in a large reduction in costs for the smaller system. However, the

lack of contribution from the small system to the large system may discourage it from dealing with the smaller system.

The absence of pooling studies may lead to uncertainty about the potential savings from interconnection. Reserve sharing alone may not provide adequate cost savings to justify the the transmission investment required for pooling.

The cost of centralized dispatch may discourage pool development. The major capital costs are remote control equipment and computer hardware. The need for a formal pooling agreement and the resulting loss of sovereignty to the participating utilities also discourages this option. Bilateral agreements and energy broker options are alternatives which allow power pooling without resorting to centralized dispatch.

Political Issues

The loss of sovereignty results in reduced flexibility for the participants. Planning, construction, and operating decisions formerly autonomous become group decisions. The participants take on an obligation to support the group. The degree to which sovereignty is lost is a function of poll integration. Pools have attempted to mitigate the loss of sovereignty by 1) requiring unanimous decisions on major issues, 2) establishing reserve requirements based on a uniform percentage of each system's peak demand, and 3) allowing generation expansion outside of the pool's expansion plans.

The obligations of the participants to the pool sometimes becomes burdensome. Utilities may request flexibility in applying the pool's operating and planning standards. Occasionally they find it impossible to meet their pool commitment of generating capacity and operating reserves.

Pool participants accept the risk that they may be exposed to operating, financial, or managerial problems of their pooling partners. A pool-wide blackout is an example of an operating risk. Other problems of coordination are more common. Pool participants may be exposed to project cost overruns or to a partner's inability to raise capital in a joint venture. A partner may be unable to meet its commitments to the pool. Worse, a partner may choose not to meet its commitments. Lastly, an insurmountable common problem, such as fuel unavailibility, may affect the power pool.

Integration is the key problem in group decisionmaking. Should the pool be a loose pool or a tight pool? Which of the pool's functions should be joint actions and which should be individual actions? The difficulty of joint decisionmaking may win out over the economics of integration. The pool must decide between formal group planning or coordinated individual planning. The pool must choose between

bilateral pooling agreements or a comprehensive multilateral pooling agreement.

Equitable sharing of obligations and costs requires specific measures to curb the potential abuse of the pooling arrangements. Particular areas of concern are 1) capacity responsibilities, 2) charges for capacity deficiency, 3) designation of pool facilities, 4) the allocation of saving from economy interchange, 5) shares of joint ownership of facilities, and 6) wheeling charges.

Regulatory agencies have insisted that pooling arrangements be subject to their purview. This is particularly true for environmental impacts and the establishment of rates.

Rate related issues are 1) the recovery of direct costs, 2) incentives to provide pooling services, 3) penalties to discourage overreliance on the pool, and 4) the allocation of pooling benefits. The most frequent method of pricing pooling benefits is the split-savings approach. This method charges pooling services at the seller's incremental cost plus one half of the purchaser's savings

Requirements for Power Pooling

In a study of the power pool which has evolved on the Florida peninsula since the late 1950s, the Florida Coordinating Group identified five evolutionary stages of development for the power pool. Table 2 presents this evolutionary view.

The first stage is establishing procedures for emergency interconnection. There are several important issues to be resolved at this stage. Who owns the tieline? What are the conditions for providing emergency power? How should emergency power be repaid? What are the recovery procedures?

The second stage is establishing coordinated operating policies. Formalized bilateral agreements must be established at this stage. Once again there are important issues. What are the spinning reserve levels? What are the operating reserve levels? How are reserves allocated to each utility?

The third stage is creating economy interchange procedures. At this point the FCG established an "energy broker system." Each utility constantly monitors its incremental and decremental costs attempting to find both purchasers and sellers through a centralized auctioneer. Again the issues: How to identify potential buyers and sellers? What is the best mechanism for allocating the savings from economic dispatch? How to establish wheeling rates?

The fourth stage requires the establishment of a comprehensive multilateral pooling agreement. At this point the pool establishes centralized dispatch. More issues must be resolved. What is the mechanism for the purchase and sale of reserves? How are fuel price differentials

TABLE 2

STAGE	INFORMAL AGREEMENTS	FORMAL AGREEMENTS	MULTILATERAL AGREEMENT
EMERGENCY INTERCONNECTION	X	X	X
COORDINATED POLICIES		X	X
ECONOMY INTERCHANGE		X	X
CENTRALIZED DISPATCH			X
INTEGRATED PLANNING			X

considered? What is the mechanism for transmission access and pricing? How are capacity organizations established? Is the transmission system adequate? How are incremental and decremental costs defined? How are saving defined and allocated? The complexity of this stage is reflected in the fact that the FCG was established in 1957 and still does not have centralized dispatch.

The fifth stage is the establishment of an integrated planning program. More issues: What are the geograghic areas for expansion? What are the siting criteria? What are the critera for expansion? What is the mechanism for the financing and construction of joint ventures?

Allocation of Economy Interchange Savings

The actual dispatch of generating units should not be affected by the savings allocation method selected. However, the failure to agree on a method might cause a utility not to participate in the dispatching pool.

The first method presented is the high-low method. In this method the highest incremental cost buyer is matched to the lowest incremental cost seller successively until all power needs are met.

ASSUMPTIONS

GENERATING UTILITY	ENERGY PURCHASED	ENERGY SOLD	INCREMENTAL ENERGY COST
A	-- MWh	50 MWh	20 $/MWh
B	--	50	25
C	25	--	30
D	75	--	35

$$\text{SAVINGS s} = \sum_{i}^{n} \text{MWh s} * \frac{\lambda p - \lambda s}{2}$$

$$\text{SAVINGS p} = \sum_{i}^{n} \text{MWh s} * \frac{\lambda p - \lambda s}{2}$$

Where:

SAVINGS	=	The savings from a given economy interchange transaction
MWh p	=	The energy purchased in the transaction
MWh s	=	The energy sold in the transaction
λ p	=	The incremental fuel cost of the purchaser
λ s	=	The incremental fuel cost of the seller
i	=	index for utilities entering into the transaction
n	=	the total number of buyers or sellers

HIGH-LOW METHOD RESULTS

SELLER	BUYER	AMOUNT	SAVINGS
A	D	50 MWh	$375.00
B	C	50 +	
B	D	25	$187.50
TOTAL SAVINGS TO SELLERS			$562.50
B	C	25	$ 62.50
A	D	50 +	
B	D	25	$500.00
TOTAL SAVINGS TO PURCHASERS			$562.50

In the pool average method the pool becomes an entity in itself. The pool buys power at the average buyer's value and sells power at the average seller's cost. The formulae for evaluating savings using the pool method are:

$$APBV = \frac{\sum_{i}^{n} MWh_{pi} * \lambda_{pi}}{\sum_{i}^{n} MWh_{pi}}$$

$$APSC = \frac{\sum_{i}^{n} MWh_{si} * \lambda_{si}}{\sum_{i}^{n} MWh_{si}}$$

$$SAVINGS_s = \sum_{i}^{n} MWh_{si} * \left[\frac{\lambda_{si} - APBV}{2} \right]$$

$$SAVINGS_p = \sum_{i}^{n} MWh_{pi} * \left[\frac{APSC - \lambda_{pi}}{2} \right]$$

Where:

APBV	=	Average pool buying value
APSC	=	Average pool selling cost
MWh pi	=	The energy purchased by purchaser i
MWh si	=	The energy sold by seller i
λ pi	=	The incremental fuel cost of the purchaser i
λ si	=	The incremental fuel cost of the seller i
i	=	index for utilities entering into the transaction
n	=	the total number of buyers or sellers

POOL AVERAGE METHOD RESULTS

SELLER	BUYER	AMOUNT	SAVINGS
A	P	50 MWh	$343.75
B	P	50	$218.75
TOTAL SAVINGS TO SELLERS			$562.50
P	C	25	$ 93.75
P	D	75	$468.75
TOTAL SAVINGS TO PURCHASERS			$562.50

Another pool average method attempts to reflect the relationship of the incremental fuel cost to the pool average buying value and selling cost. The formulae for this adjusted pool average method are:

$$\text{SAVINGS}_s = \sum_{i}^{n} \text{MWh}_{si} * \left\{ \frac{\text{APSC} - \left[\frac{\lambda_{si} + \text{APBV}}{2} \right]}{2} \right\}$$

$$\text{SAVINGS}_p = \sum_{i}^{n} \text{MWh}_{pi} * \left\{ \frac{\text{APBV} - \left[\frac{\lambda_{pi} + \text{APSC}}{2} \right]}{2} \right\}$$

ADJUSTED POOL AVERAGE METHOD RESULTS

SELLER	BUYER	AMOUNT	SAVINGS
A	P	50MWh	$312.50
B	P	50	$250.00
TOTAL SAVINGS TO SELLERS			$562.50
P	C	25	$117.19
P	D	75	$445.31
TOTAL SAVINGS TO PURCHASERS			$562.50

Each method progressively smooths out the distribution of economy interchange savings among the pooling parties. This may or may not be desirable. There is no economic criteria for selecting one method over another. The method selected depends upon the results of negotiations between the parties.

Power Pooling in Alaska

The Southcentral and Interior Alaska load centers have been interconnected with the completion of the Anchorage to Fairbanks Electrical Intertie in September 1985. Interchange agreements are only now being negotiated between the Southcentral and Interior electrical utilities. Interchange agreements do exist within each region, however.

Southcentral Region

In the Southcentral region the CEA* generates power for itself, MEA, HEA and the City of Seward. MEA and HEA have formed the AEG&T. This new entity has just completed construction of a gas turbine in Soldotna which will be placed in service after testing. AEG&T will continue to buy power from CEA and will sell power to CEA as well.

ML&P generates power for itself and has power contracts with Ft. Richardson and Elmendorf Air Force Base. The bases primarily generate their own power. The APA, a federal agency, operates the Eklutna Hydroelectric Project and sells power to both CEA and ML&P.

ML&P and CEA are intertied at the APA's Eklutna substation. In 1982 the utilities began to operate their systems in parallel with power transfers made during emergencies. At the time CEA was requesting a rate increase from the APUC. Simultaneously, the APUC was conducting an audit of CEA's management practices. On February 18, 1983, the APUC ordered CEA to submit to a joint study with ML&P setting out the operational and technical requirements for economy power interchanges between the utilities. On April 1, the utilities responded by presenting an Interim Interconnection Agreement for emergency, maintenence and economy power interchanges between CEA and ML&P. This agreement was superseded by a permenant agreement on December 2, 1983. Subsequently ML&P has added unit 8 to its Sullivan Generating Plant to jointly serve ML&P and CEA. Table 3 shows the generating resources for the Southcentral region.

Interior Region

In the interior region, the Fairbanks Municipal Utilities System and the Golden Valley Electric Association are interconnected and participate in an economy interchange agreement with Ft. Wainwright. The GVEA-FMUS power sales agreements were negotiated in the 1960s and were the first such agreements in the state. Subsequent agreements have been modeled after the GVEA-FMUS format. GVEA has an interchange agreement with the University of Alaska - Fairbanks to purchase the excess output from its small coal-fired steam cogeneration plant, as well. Table 4 shows the generating resources for the Interior.

Anchorage to Fairbanks Electrical Intertie

The Southcentral and Interior Alaska load centers are interconnected via the recently completed Anchorage - Fairbanks Electrical Intertie. This 345 KV transmission line was built at a cost of $122.5 million. Completed in September 1985, the line was constructed by the Alaska

TABLE 3

SOUTHCENTRAL GENERATING CAPACITY

ML&P	UNIT	CAPACITY	TYPE	FUEL
	1	16 MW	GT	GAS
	2	16	GT	GAS
	3	18	GT	GAS
	4	32	GT	GAS
	5	36	GT	GAS
	6	33	ST	---
	7	74	GT	GAS
	8	74	GT	
SUBTOTAL		299		

CEA	UNIT	CAPACITY	TYPE	FUEL
BELUGA	1	16	GT	GAS
	2	16	GT	GAS
	3	53	GT	GAS
	5	58	GT	GAS
	6	68	GT	GAS
	7	68	GT	GAS
	8	54	ST	---
BERNICE LAKE	1	9	GT	GAS
	2	18	GT	GAS
	3	27	GT	GAS
	4	27	GT	GAS
COOPER LAKE	1	8	H	---
	2	8	H	---
INTERNATIONAL	1	14	GT	GAS
	2	14	GT	GAS
	3	18	GT	GAS
SUBTOTAL		476		

AEG&T	UNIT	CAPACITY	TYPE	FUEL
	1	36	GT	GAS
SUBTOTAL		36		

APA	UNIT	CAPACITY	TYPE	FUEL
	1	15	H	---
	1	15	H	---
SUBTOTAL		30		

TOTAL	841

TABLE 4

INTERIOR GENERATING CAPACITY

FMUS	UNIT	CAPACITY	TYPE	FUEL
	1	5	ST	COAL
	2	2	ST	COAL
	3	3	ST	COAL
	4	7	GT	OIL
	5	20	ST	COAL
	6	29	GT	OIL
	D1-3	6	D	OIL
SUBTOTAL		72		

GVEA	UNIT	CAPACITY	TYPE	FUEL
HEALY	S1	25	ST	COAL
	D1	3	D	OIL
NORTH POLE	1	65	GT	OIL
	2	65	GT	OIL
ZEHNDER	GT1	14	GT	OIL
	GT2	18	GT	OIL
	GT3	3	GT	OIL
	GT4	3	GT	OIL
	D1-7	21	D	OIL
SUBTOTAL		217		
TOTAL		289		

Power Authority. The northern portion of the line will be operated by GVEA. The southern portion will be operated by ML&P. Line testing began on October 16, 1985. It provides for power sales by ML&P to GVEA in emergencies, during generator maintenence and for economy power interchange. The agreement will be superseded by a formal Power Sales Agreement currently under negotiation. CEA and GVEA are finalizing a power sales agreement as of this writing.

A more general Alaska Intertie Agreement is being negotiated to formalize operation of the intertie. This agreement includes all of the utilities in the interconnected area, the AkPA and the APA. It provides for the administration of the line by GVEA and ML&P. It also provides for the apportionment of energy transfer capability and costs of the line among the participants. An operating committee of the participants is also provided to administer the agreement.

The decision to construct the Anchorage - Fairbanks intertie reflects the economic growth in the area. This has caused tremendous load growth for the utilities in both load centers. With load growth the utilities have been able to increasingly capture the available economies of scale in both transmission and generation. CEA and GVEA have located generation facilities at remote locations where fuel is less expensive than other alternatives. In the case of GVEA this is the coal mine at Healy. In the case of CEA this is the natural gas field at Beluga.

CEA-ML&P Merger

The REA has eliminated its subsidized loans to REA cooperatives over the past decade. CEA will be forced to finance new construction at the market rate of interest. ML&P as a political subdivision can sell bonds at tax exempt rates. Recently, the mayor of Anchorage appointed a blue ribbon committee to study the issue of merging the two utilities, but it is unclear at this time what the merger committee will recommend.

Hydroelectric Development

The State of Alaska pursued an agressive hydroelectric construction program in the early 1980s. Green Lake near Ketchican, Swan Lake near Sitka, Tyee Lake near Wrangell and Petersburg, Solomon Gulch near Valdez, and Terror Lake near Kodiak were all constructed with state funds. Recently, declining state revenues brought about by lower world oil prices, increasing doubts about the economic feasibility of hydroelectric generation vis-a-vis gas, oil and coal, and continuing environmental opposition have dampened enthusiasm for hydroelectric development. Even so, the Bradley Lake Project will probably be built. The project has a very high economic return with very little environmental impact. The AEG&T seems well poised to operate and utilize this project.

More problematic is the fate of the 5.2 billion dollar Susitna project. The high price tag worries legislators and politicians concerned with allocating a shrinking public purse. Environmental forces recently succeded in a judicial challenge to the existing Susitna funding scheme. The AkPA has recently filed an updated liscense application with the FERC envisioning a three-stage construction program for the project. Construction should proceed in 1987 if the financing and liscensing problems can be overcome.

The alternative to the Susitna project is the construction of a series of coal-fired steam generating plants. These plants are expensive to construct and require extensive environmental investigation. Gas turbines which are the dominant form of generation in Southcentral and Interior

Alaska are becoming uneconomic with the extinction of Cook Inlet gas supplies. Table 5 shows the effect of the Anchorage-Fairbanks Intertie on generation capacity requirements in Southcentral-Interior Alaska.

TABLE 5

REQUIRED ADDITIONAL GENERATING CAPACITY

YEAR	WITHOUT INTERTIE	WITH INTERTIE	INTERTIE SAVINGS
1984	---	---	---
1985	18	---	18
1986	36	---	36
1987	55	---	55
1988	75	---	75
1989	94	3	91
1990	114	19	95
1991	155	51	104
1992	199	85	114
1993	245	120	125
1994	293	158	135
1995	343	208	135

Conclusions and Recommendations

Many good things have happened since this article was originally drafted in 1982. CEA and ML&P have entered into a power sales agreement. The Anchorage to Fairbanks electrical intertie has been constructed. An Alaska intertie Agreement is under negotiation. Perhaps the most encouraging is the new spirit of cooperation and joint action which has developed among the Southcentral and Interior electric utilities.

Much remains to be done however. The interconnected electric utilities must rapidly form an effective power pool. If the Susitna project is delayed or not constructed, generating resources will be stretched to the limit during the 1990s. Cook Inlet gas supplies will be dwindling then and energy prices should once again be on the rise. The alternative of constructing coal-fired steam generating plants will require joint action. If the author is right and a coal-fired plant requires 12 years to build, then joint planning must start now. Additional base load generation should be needed starting in 1992. The potential for a crises exists if the Susitna Project or the alternative coal-fired plants cannot be completed until 1997. A Southcentral-Interior Alaska Power Pool could be a very effective agent for electrical power interchange, joint action and public awareness.

*ABBREVIATIONS

AEG&T	Alaska Electric Generation and Transmission Cooperative
AkPA	Alaska Power Authority
APA	Alaska Power Administration
APUC	Alaska Public Utilities Commission
CEA	Chugach Electric Association
FMUS	Fairbanks Municipal Electric Utility
HEA	Homer Electric Association
GVEA	Golden Valley Electric Association
MEA	Matanuska Electric Association
ML&P	Anchorage Municipal Light and Power

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Vice Chancellor John Brownell congratulates Dwight Spargur